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EDITORIAL.

Dr. Hoffmann and the Pharmaceutische Rundschau.

ONE of the most interesting problems which presents itself to the historical student of our profession is to ascertain the influence European countries have had upon the development of pharmacy in this country. The student of the history of civilization likes to dwell upon the benefit derived from close contact between nations. Whether conqueror or conquered the superior nation will give its impress to the type of civilization that follows.

The United States furnish a most interesting field for study in this direction. The interest that attaches to the conquest of the Indian, whether the barbarian of the north or the semi-civilized inhabitant of Mexico and Peru; or to the fight for supremacy on the northern half of this continent between the Spanish, French, Dutch and English in the first centuries of American history, is insignificant to that which is manifested in the amalgamation of nations and the possible characteristics of the ultimate American. The battles fought in the earlier period of our history were largely of arrows and fire-arms, of powder and more powder. The battles that are oft-times, but more silently fought today between the various nationalities are of a different order. Armies of immigrants have invaded this country at its many open ports. The Dutch of New York, the early Germans of Pennsylvania, the French of the northwestern frontier, have disappeared as such. Their names have oft-times been modified to such an extent that one may not even suspect the "foreign" blood. Surely the Herkomers of the Mohawk Valley and the Moravians of Pennsylvania, though deprived of their German names, have left us more than mere traditions of heroic defense in battle and of attempts to lead a spiritual life in the wilds of America.

Their descendants are no longer Germans but have been Americans for generations. The Puritans of New England, although they have retained their language, and though their names have descended unmodified to the present generation, have probably changed as much.

To the American pharmacist, contemporaneous history and the history of the immediate past may be as intensely interesting as that of the period or periods when his art was practiced by the priests in the temples of Egypt or Greece, or when an apothecary introduced a Scheele, a Lavoisier or a Liebig into the art of pharmacy.

It is generally acknowledged that pharmacy in this country is passing through a period of transition. Will it rise to the dignity of a learned profession or will it degenerate completely to a mercantile calling, is the question which constantly presents itself for discussion wherever pharmacists gather.

A problem which is of equal interest to the present student of history is to ascertain the influence that European institutions and Europeans themselves have had in shaping the present *status quo* of American pharmacy.

It may be said without doubt that the Frenchman has made but an ephemeral impress, if any, on American pharmacy. His general civilizing power on this continent has not been of great permanence. From the Englishman we no doubt have received the *laisser faire* policy in business and profession. Such restrictions of trades and professions as were traditional in Old England could find but limited application on a new continent. The theories of Adam Smith found little to contend with in this country; when unchecked by tradition they could find almost universal application and sway.

German influence, in pharmacy at least, was quite to the contrary. It is not without significance that pharmaceutical legislation soon followed the immigration of the better class of Germans. The protection of the public against the ignorant practitioner is irrevocably bound up with the history of pharmacy and medicine in Germany. That the educated German apothecary, who has come to this country, has given his impress to American pharmacy is undeniable.

If a careful investigation were made of the career of German apothecaries who have come to this country many interesting facts would be brought to light.

It might be shown that most so called "*deutsche Apotheker*" would not be entitled to this name in Germany, because they had not completed their course of study. Comparatively few had attended the university and had passed the state board examination, which is necessary before the title *Apotheker* can be assumed. Behind the coveted sign of *Deutsche Apotheke* there stands, in this country, many a man who has not even been in Germany, but has in this country served an apprenticeship with a socalled German apothecary. Yet among the latter class are some of the most successful, in a financial way, of our German-speaking pharmacists. Of the academically educated pharmacists many have been lost to pharmacy in this country, because their true value was unappreciated or even unknown within their own ranks. Of the few who have remained true to their profession, the majority are not found in conspicuous places. On the other hand, some favored few with less education and ability have been professors or have held other positions of confidence and esteem.

These general remarks made by way of introduction will, it is hoped, help to pave the way for a better understanding of a person who has spent the best years of his life in advancing the cause of professional pharmacy, particularly in this country, and who though widely known has not always, perhaps even seldom, been understood.

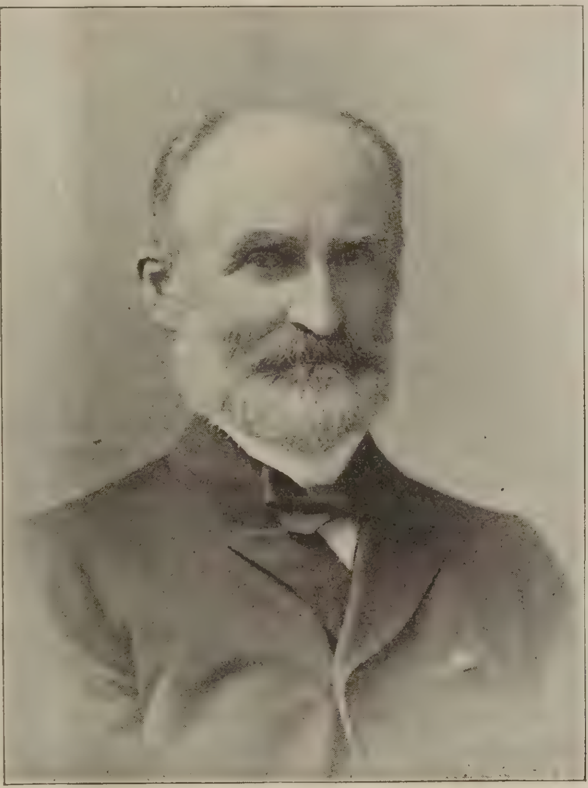
Frederick Hoffmann was born on the twentieth day of June, 1832, in Wriezen on the Oder. His father, who was pastor, and rector of the city schools, left soon after to assume the duties of pastor in Lunow on the Oder. Frederick was prepared for the *Gymnasium* by private instruction from his father, who was as good a philologist as theologian. He was admitted as *Tertianer* in the *Alumnat* of the *Joachimsthal Gymnasium* in Berlin. After an attendance of two years he left at Michaelmas 1847 to enter the pharmacy of J. F. Holtz in Prentzlau, as apprentice for four years. The preceptor, who was rather advanced in years, demanded strict discipline. In those days the apprentice was still addressed with "*Du*" and his duties were not always agreeable. Although his apprenticeship would today be considered austere, yet such training created a class of apothecaries who were exact even in small things, and who were imbued with a high sense of order, duty and responsibility.

Hoffmann's preceptor tolerated study only in the evening after the apothecary-shop had been closed, and then only to a limited extent, for the use of lamps in the attic chambers was not allowed. Neither the preceptor nor the assistant gave any instruction. Hagen's and Buchner's handbooks, Dulk's Commentary of the Prussian Pharmacopoeia, and a flora of the province of Brandenburg were the literary resources of the apprentice. In the second year he obtained a copy of Stöckhardt's Schule der Chemie, which had just appeared. This book became a special source of enthusiasm and inspiration. With the aid of this book, and without the permission and knowledge of the preceptor, experiments were made, particularly in qualitative chemical analysis. During the last two years the young apprentice worked out a problem for which the North German Apothecaries' Society had offered a prize. The successful competition carried with it no small embarrassment, inasmuch as the strict preceptor learned of the secret occupation of his apprentice. The reprimand was not administered, however, without an expression of appreciation. He became more tolerant, and during the summer months permitted several hours in the early morning to be spent in making botanical excursions. During this period Hoffmann took another prize for a competitive paper entitled Reinigung des Weinsteins.

Having served his time as apprentice, Hoffmann remained another half year as assistant. He then served in a similar capacity during the years 1851 to 1854 in Magdeburg, Erfurt and Suhl. In 1853 he contributed a paper on burnt magnesia to Hirzel's Zeitschrift, in which his prize papers had been published. During the same year he delivered an address on the Value of Pharmaceutical Societies, before the German Pharmaceuten-Verein.

It is but natural that this young assistant who was willing to deprive himself of rest and sleep, at night to make chemical experiments, or in the early morning to go on botanical excursions, was an ardent devotee and advocate of science. The following paragraph, quoted from this address, is characteristic of the youthful scientist bubbling over with enthusiasm.

> "Sollte nun Jemand fragen: Was haben wir von der Wissenschaft, welche Vortheile gewährt sie uns? so ist diese Frage total unwissenschaftlich; denn die Wissenschaft ist sich selbst Zweck, nur um ihrer selbst willen treiben wir sie. Wer pecuniäre Vortheile und materiellen Nutzen sucht, der wende sich an alles Andere, nur nicht an die Wissenschaft; sie verlangt ein uneigennütziges und selbstständiges Interesse. Unbelohnt lässt sie indess ein edles Streben nie, denn ein reiches tiefes Wissen ist ein unvergänglicher Schatz, der den Geist veredelt; es ist ein sicherer Führer und Kompass durch die Irrgänge des täglichen Lebens und versüsst die oft lästigen Arbeiten eines einförmigen Berufs. Gewiss wird Manchem von uns unser Beruf oft langweilig und einförmig erscheinen; aber das ist er nur, wenn wir den Apotheker zum Empiriker, zum Kaufmann herabwürdigen. Treiben wir die Pharmacie als Wissenschaft und ergeben wir uns ihr mit selbstständigem, wissenschaftlichem Interesse und regem uneigennützigem Streben, dann werden jene unzufriedenen Stimmen seltener werden, und wir werden die Lasten und Entbehrungen, die unser Beruf erfordert, freudig ertragen."



Dr. Frederick Hoffmann.

At Easter, 1854, Hoffmann entered upon his studies at the University of Berlin. He attended the lectures of Otto Berg on botany, pharmacognosy and microscopy; of Dove on physics and meteorology; of Heinrich Rose on experimental inorganic and organic chemistry and pharmacy; of E. Mitscherlich on chemistry and phyto-chemistry; of Ehrenberg on physiology and microscopy; of Alexander Braun on natural history and botany; of Klug on entomology; of Johannes Müller on physiology; and of Ritter on comparative geography. Many of Hoffmann's later writings bear witness to the inspiration derived from these men. In 1856 he passed the state board examination before the Medizinische Ober-Examinations-Commission. Having a great liking for botany and for scientific agriculture and forestry, and being encouraged by E. Mitscherlich, Otto Berg and Schultz-Fleeth, Hoffmann began studies along these lines in order to prepare himself as teacher at some agricultural school. Meanwhile his father had been transferred as counsellor of the consistory of Stettin. Inasmuch as six younger brothers had to be educated, Frederick, the oldest, could not expect his father to maintain him at the university a number of years after having completed his course of professional studies. Having taken his degree he therefore returned to pharmacy. For several years he held positions in Berlin, Friedland, Elberfeld and Stettin. Then for a year he was proprietor of a pharmacy in a small town in Pommerania.

At about this time French patentees of Lyons threatened the infant aniline industry in the United States with destruction by pushing their claimed patent rights. In this emergency the American manufacturers and importers looked about for a chemical expert to assist them in their case. Dr. Hoffmann was recommended to them, and thus it came about that he sold his pharmacy and came to New York in 1867. A brochure entitled: "A critical rewiew of the history of aniline and the aniline colors" was the literary product of his first labors on the American continent. This at once established his reputation as a chemist. After the successful completion of his duties in this direction, which was of no small import in the effect it had on the development of American chemical industry, Hoffmann established himself as consulting chemist. Especially as chemist for several large cotton factories he found renumerative and instructive employment. At the same time he examined commercial chemicals, and gave instruction in chemical analysis in Professor Boeck's flourishing technical school for engineers and chemists. He also gave instruction in physics and chemistry in the most important private German school in New York, that of Dulon, Gehrke and Koessly. During this period he delivered a number of scientific and popular-scientific public lectures and wrote articles of similar character for the New York Staatszeitung, Lexow's Belletrisches Journal and Caspar Butz's Deutsch-Amerikanische Monatshefte.

At this time New York was not overrun with drug-stores as it is today, nor did the soda-water fountain with its accessories play such an important role. The association with German physicians and apothecaries revived the old love for pharmacy. The result was that in 1866 Hoffmann bought the drug-store of a Scotch physician in one of the more densely populated quarters of New York. This he, however, soon sold back to the original owner in order to purchase one of the older and most important German pharmacies, which he conducted successfully for sixteen years.

During this long period as practicing pharmacist, Dr. Hoffmann was not only a successful business man but served both physician and general public in a truly professional capacity. His opinion as a pharmaceutical expert was frequently sought by physicians. He also continued his work as analyst. In spite of these numerous duties he found time for scientific and literary work. Pharmaceutische Briefe aus Amerika, On Cremation, German Universities, Centennial of Chemistry, Chemie des Pflanzenwachsthums, Biographical sketches of Ehrenberg, Wm. Proctor, Heinrich Dove, John M. Maisch and Fr. Mohr, all date back to these busy years. But these papers were of minor importance when compared with the results of the author's labor in other directions. In 1869 he prepared the annual report on the progress of pharmacy for the American Pharmaceutical Association. This report was one of the best, if not the best, ever written for the national association and deserved all the praise which Professor Proctor, then editor of the American Journal of Pharmacy, bestowed upon it.

Dr. Hoffmann, however, was not only a master of scientific pharmacy. In general professional and educational matters he was both pioneer and master. When in 1871 an absurd pharmacy law was forced upon the druggists of New York he fought successfully against the same with the pen and before the legislature. His Essays on Pharmacy in Prussia and the German Empire, and Problems and Future of Pharmacy in Germany received considerable attention abroad and show how large and widespread was his influence in professional matters. In like masterly manner he fought against the nostrum evil in 1874 and 1876.

The United States Pharmacopoeia of 1870 was sadly in need of revision. Dr. Squibb had suggested a plan for revision and had been seconded in his work by the American Pharmaceutical Association in 1876. He then laid the matter before the American Medical Association at its meeting in Detroit. Instead of receiving the support of this association he was literally buried under personal slander. Discouraged, he was about to give up all further attempts. At this critical moment Dr. Hoffmann clearly reviewed the situation and brought it forcibly to the attention of the American Pharmaceutical Association at its meeting in Toronto in 1877. A set of resolutions demanding a change was adopted. The national convention, a self-constituted body, was made up of representatives of a host of medical and pharmaceutical associations and colleges, the former predominating largely. The American Medical Association and the American Pharmaceutical Association, the most representative medical and pharmaceutical organizations, were not represented. The adoption of the resolutions already mentioned was the first step taken toward a larger and more adequate representation of pharmacists on the Committee of Revision elected by the National Convention of 1880. This change has been accompanied by a decided improvement in the scientific character and value of the sixth and seventh revised editions of the United States Pharmacopoeia.

In 1873 the first edition of Hoffmann's Manual of Chemical Analysis was printed. This book filled an important gap in American pharmaceutical literature, and a second edition became necessary in 1877.

In educational matters Dr. Hoffmann also took a lively interest, as is shown by several articles. As a member of the New York College of Pharmacy he delivered an address before the same in 1874 on "The application of the microscope in pharmacy and the drug trade." This lecture was the first of its kind in America and the first demonstration illustrated by excellent mounted specimens of pharmacognostical microscopical slides. Dr. Hoffmann, having been a student with Ehrenberg and Otto Berg at the University of Berlin and an assistant of the latter, had a large collection of such slides, including the famous collection of C. Rodig. From this the late Prof. Maisch became first acquainted with such collections, and later on secured one for his own use, which is now a part of the collection left by him to the Philadelphia College of Pharmacy.

Inasmuch as many pharmaceutical writers in recent years have implied that they had done pioneer work in introducing the microscope into pharmaceutical education, The Pharmaceutical Era only little more than a year ago saw fit to republish this article, calling due attention to Dr. Hoffmann's services.

Minor articles of this period can well be overlooked when there is such an abundance of valuable material. And all this was accomplished during the busy life of a practicing pharmacist. It is not necessary for pharmaceutical teachers, who wish to encourage their students to continue their scientific work after leaving college, to go back to past centuries in order to find illustrations of what can be achieved by a pharmacist in spite of long hours of duty behind the counter and the prescription case. The enthusiast who loves his profession, and who has not selected his calling for purely material reasons, will find time for scientific work, if not during the day, then at night.

In 1881 Dr. Hoffmann was appointed as one of the three experts of the newly-created State Board of Health. He held this position until 1883 when the necessary funds were withdrawn by the legislature. During these two years he wrote two reports on the examination of medicinal drugs and chemicals. In 1883 the third edition of the Manual of Chemical Analysis was also published. In the revision the author associated with himself Dr. Frederick B. Power.

Beside the article "On the application of the microscope in pharmacy and the drug trade" republished by the Pharmaceutical Era in 1894 there are other articles that might well be reprinted today, so masterly were they written. In the development of American pharmacy these articles have no small mission. Yet all these years of self-denying labor in behalf of truly professional pharmacy, with their many masterly achievements, are but as the *Lehr- und Wanderjahre* of Dr. Hoffmann, the editor. A student *par excellence* from his apprenticeship days to mature age; an investigator almost from the very beginning of his pharmaceutical career; with a natural love for plant life, yet through circumstances a chemical expert; with a practical knowledge of everyday pharmacy on both sides of the Atlantic; a keen observer of the advantages of professional pharmacy as well as of the shortcomings of the drug-trade; an enthusiastic devotee to all that is ennobling in the calling of the pharmacist; a counsellor in matters pertaining to scientific pharmacy, pharmaceutical education and legislation, an *Apotheker vom alten Schrot und Korn*, yet with ideas in advance of most of his colleagues and with no mean literary ability to make his ideas clearly understood; a personal acquaintance of most men ranking high in pharmacy both in Europe and America; such is Dr. Hoffmann preparing his first manuscripts for the Pharmaceutische Rundschau in the Catskill mountains in the late summer of 1882. Recognized master as he is at the time, the true *chef-d'œuvre* still lies before him at the mature age of fifty. The editor enters upon his duties, not as apprentice, but as master.

The thirteen volumes of the Pharmaceutische Rundschau are a monument to their founder and editor more lasting than marble or bronze. If one takes into consideration that in filling 3700 double column quarto pages the editor was dependent to no small degree on his own resources, the work assumes an almost stupendous magnitude.

Aside from the excellent monthly reviews and literary criticisms and the numerous original contributions, there appeared no less than 300 editorial articles. No other pharmaceutical editor in this country has ever wielded the editorial pen with such power and authority as did Dr. Hoffmann. He has not only acted as a reporter and recorder of pharmaceutical events, but as Prof. Flückiger wrote in 1888 has given a true picture of pharmacy, particularly of pharmacy in the United States, which will be useful for all times.

> "Es ist ihm Herzenssache, die Erfahrungen und den intellektuellen Gewinn einer vielfach bewegten, selbstgeschaffenen Laufbahn seinem Berufe nutzbar zu machen. Wir erkennen die ideale Gesinnung und Absicht des Herausgebers, sich durch Förderung und Hochhaltung der besten und am meisten erhaltungswerthen Interessen und Aufgaben der Pharmacie dem liebgewonnenen Berufe dankbar zu erweisen und für den gedeihlichen Fortbestand desselben, für dessen ursprüngliche, wie für neu entstehende Aufgaben, zwar nicht im alten Vaterlande, sondern in der neuen Heimath nach besten Kräften und in redlichem Streben mitzuwirken, wie er es eingehender im ersten Bande der Rundschau auseinandergesetzt hat."

That Dr. Hoffmann should have come in conflict with many evils that are incidental to the juvenile period of American pharmacy can only be mentioned to his credit. With a strong inclination to optimistic ideals, but not blind to the shortcomings of an aspiring profession, he has measured the standard of pharmacy by a lofty measure. His outspoken sense of truth and his emphatic opposition to everything sham has ofttimes led to misunderstanding on the part of those who possibly tried to do well but failed in great part. Whereas even his enemies cannot deny him their admiration, yet both friend and foe have been inclined to regard him as being pessimistic. It is true that the critic reared and educated in Europe may, in judging American conditions, easily do injustice to the laborers in the American field. Prof. Flückiger, who until his visit to the United States in 1894, regarded everything pertaining to pharmacy in America in a very rosy light may for this very reason be considered as an impartial judge. He wrote the following words on this very point for the Pharmaceutische Zeitung in 1888.

> "Für den aus deutschen Verhältnissen und Anschauungen hervorgegangenen Kritiker liegt die Gefahr sehr nahe, in bester Absicht über das Ziel hinauszuschiessen. Diese Klippe versteht Dr. Hoffmann, wenn wir richtig sehen,

mit grosser Umsicht zu vermeiden. Langjährige Erfahrung, die ruhige Ueberlegung des reiferen Alters, das Bewusstsein eines reinen selbstlosen Strebens drücken der Pharmaceutischen Rundschau einen uns in hohem Grade anmuthenden Stempel auf. Der Erfolg dieser Zeitschrift spricht laut genug dafür, dass die Befähigung und die Berechtigung ihres Gründers und Leiters, wie nicht minder die Lauterkeit seiner Absichten in weiten Kreisen gewürdigt werden. Im Interesse unseres Standes, im Interesse der amerikanischen Gesundheitspflege muss man aufrichtig wünschen, dass jener Erfolg sich mehr und mehr befestige und zur Freude des opferwilligen Herausgebers sich je länger je wirksamer erweise."

If Dr. Hoffmann is a pessimist, then it were good for American pharmacy if it had more of this class of people. It is true that when only twenty years of age his experience had taught him to regard the drug business as a failure and in his address before the Pharmaceutische Verein he emphasized this fact. At the same time, however, he pointed out the path which the pharmacist must follow to make his profession a success. This double action is characteristic, not only of Hoffmann, the "Apotheker Gehilfe," but of Hoffmann the practicing pharmacist and editor. His criticism is never destructive but constructive. The enthusiastic apprentice who after long hours of hard work, will deprive himself of his night's rest in order to grapple with the elements of science; the practicing pharmacist, who in spite of the day's labor of professional service, finds time not only for popular scientific lectures and pharmaceutical work of a high order, but who is foremost in the ranks of his profession in all emergencies; he, who is pointed out as an impractical idealist and optimist, when he bears high and successfully the standard of his profession; can hardly be branded a pessimist when he becomes a critic of the shortcomings and diseases of the calling that he loves and to which he has unselfishly devoted a lifetime.

The true merits of Dr. Hoffmann have always been recognized by those who loved truth more than flattery. Most of his writings were probably above the appreciation of the average American pharmacist. It is probably but natural, therefore, that our profession at large in this country should have been slow in showing its recognition of his valuable services. On the other hand, pharmacists of various European countries have in part made up for our lethargy. Dr. Hoffmann is an honorary member of several European societies. He is one of the two Americans who have been honored with the Flückiger medal.

The fact that Dr. Hoffmann in late years has possibly taken more delight in his books than in meetings of pharmaceutical associations is but natural to advanced years. Says Goethe: "Je mehr sich unsere Bekanntschaft mit guten Büchern vergrössert, desto geringer wird der Kreis der Menschen, an deren Umgang wir Geschmack finden." Others, who have held and still hold prominent positions in the pharmaceutical ranks, have likewise withdrawn, some even at an earlier age, from promiscuous pharmaceutical gatherings. Yet those who today strive for truly professional pharmacy may well study the lives of those who in the past have successfully advanced the cause of pharmacy. If they wish to succeed they must make some of Dr. Hoffmann's mottos their own.

"Wer da fährt nach rechtem Ziel
Lern' am Steuer ruhig sitzen,
Unbekümmert, ob am Kiel
Lob und Tadel hoch aufspritzen."

Whatever may prove to be their lot, they will in advanced age, like the subject of this sketch, reflecting upon the events of several generations, be able to look back upon the past and into the future in the same calm mood in which the editor of the Rundschau wrote the closing paragraph of his last masterly "Rückblick":

"Das Alte stürzt, es ändert sich die Zeit,
Und neues Leben blüht aus den Ruinen."

The mind of one who can repeat these words at the age of more than sixty has certainly not become crystallized, but shows a capacity for accomodation that but few are privileged to enjoy. It is a guarantee that Dr. Hoffmann, as one of the editors of his metamorphosed journal, will still remain the central figure of his own creation. His many friends, as well as all the readers of the Pharmaceutical Review, will be glad to know that retirement from the more active duties of management does not imply a loss of interest or the intention to become idle in matters pertaining to pharmacy, of which he and his journal have been such prominent exponents. E. K.

Retrospect.

In entering upon the work of a new year it is no doubt important to reflect for a moment upon that which has been accomplished during the year just concluded. In looking back with calm judgment upon things in their proper relation we are likely to estimate them more correctly than in the excitement of the moment, when objects or events are ofttimes seen distorted or removed from their proper surroundings. The alpine climber likes to pause as he rises from cliff to cliff, from alp to alp, enjoying ever larger views as he ascends. The individual objects that attracted his attention on the way blend more and more into the landscape, and instead of losing in interest they simply gain thereby. The Pharmaceutische Rundschau in the past has not only reviewed the various aspects of pharmacy from month to month, but from year to year as well, ever widening its horizon as volume was added to volume.

With the general improvement of business the **commercial and financial position of the druggist** has assumed a brighter aspect. The demand for medicine, it is true, is not apt to undergo great fluctuations on account of commercial or financial complications. The professional pharmacist, therefore, was not so prone to failure financially as many others in callings purely commercial. Inasmuch, however, as the stock of the average drugstore is largely made up of things other than drugs, most druggists have been influenced more or less seriously by the general financial and commercial depression. Now that we can look back on this financial crisis it is surprising that with the enormous competition in the drug-trade and with the large amount of practically dead stock in patent and proprietary medicines, which the druggist is compelled to keep on account of an over credulous public, comparatively few druggists have been forced to the wall. During the last few years it was observable that whereas many supposed reliable business houses failed, the older pharmacists known to be professionally competent and enjoying the full confidence of their patrons apparently suffered least from the general business depression. The more professional the duties of the pharmacist the less apt is he to suffer from such crises.

The commercial druggist, on the other hand, must resort to all sorts of advertising schemes to find sale for his ware. Hence results the cutting of prices of patent medicines and advertisements of rather questionable character. Advertisement has already become an important department in a certain class of pharmaceutical journals of this country. That at such a time the question **"Is pharmacy a profession or a mere trade"** should receive attention is but a natural outcome of the situation.

If the "college professor" argues that pharmacy is a profession because several thousand young men spend a few winter evenings in the college amphitheater, whereas at the beginning of this century we had no colleges of pharmacy whatever, he may induce the college graduate to rise higher in his own estimation, but his supposed argument is no argument at all. There are many polytechnic schools in which boys and girls are taught trades. Cooking schools exist to-day, which were unknown a century and less ago. The Bridget who attended a course of lectures on cooking and who took a series of practical lessons might as well aspire to be able to yield professional services. The polytechnic schools do excellent work indeed, all the more excellent because they do not inflate the brains of their pupils with the thought of being members of a learned profession.

If on the other hand the commercial druggist says that pharmacy is no profession and that it never was a profession, he may, considering the world at large and this country in particular, not be very far from the mark; but are men with barely the rudiments of a grammar school education competent to judge what is to constitute a learned profession. This reminds us of the circular sent out by the educational section of the American Pharmaceutical Association several years ago, asking the druggists of this country, "what in their opinion ought to be taught in a college of pharmacy." It must however be said to the credit of the American druggists that with very few exceptions they were wise enough not to respond to this query.

A similar experiment was tried last year at the International Exposition at Venice with a less fortunate result. Popular suffrage was applied to the awarding of a prize for works of art. A reporter of the event, after describing the disgraceful painting which received the first prize, remarks "That the prize was awarded by popular vote speaks ill for the morals and worse for the taste of modern Italy."

Pharmacy has come into life as the hand-maid of medicine. In Europe she is still more or less under the superior control of the greater branch of the mother profession. In this country she has well nigh emancipated herself and is struggling for recognition in her independent position.

In Germany, where the educational requirements of the pharmacist are not as high as those of the physician, the former has been made to feel his inferior position, often in a very unpleasant manner. The result has been, that whereas there are still many who look forward to an improvement of pharmacy, placing it ultimately on the same plane with the other learned professions, an appreciable number have given up all claim to a professional calling and want to be considered merchants working with a high percentage of gain.

That in this country, where pharmaceutical education is still in its infancy and where most druggists have never seen the inside of a college building, even this last remnant of a professional spirit, viz., the working for high percentage profits, should have largely been lost can surprise no one. Although there are many who curse the cutter and the department store, yet there are more moving ostensibly or unostensibly with the current of the cutter. The number that considers pharmacy as a business like any other business is no longer small.

In Germany this conclusion appears as the result of a pessimistic spirit of the educated proletariat, fostered no doubt by the present high price of pharmacies on account of the system of state concessions. In America it is but a logical conclusion of prevailing circumstances. Men who have learned the "drug business" and nothing but this aspect of pharmacy, must ultimately acquire this view of their calling. They may denounce the cutter or the department store, but this is to a large extent simply a matter of protective business policy. The really true pharmacist will be only too glad to leave toilet articles to the general merchant, and secret remedies, so-called patent medicines, even to places that will bring them into greater disrepute.

It must be a matter of interest to every careful observer that England is undergoing a similar evolution. The development has reached such a stage that one of the leading pharmaceutical journals of Great Britain expounds the doctrine that "pharmacy is content to be a trade" and that the president of the British Pharmaceutical Conference finds himself constrained to rouse the truly professional remnant to greater activity.

This struggle which is going on in almost every civilized country on the globe is one of intense interest to the student of civilization. Will the tradesman or the professional scholar succeed respectively in lowering or in raising his calling? Or will America follow some of the European countries in creating pharmacists of the first and second class, Apotheker and Drogisten? This classification evidently has not simplified matters in France or Germany. It is to be hoped that this country with its possibilities for the future, will demand but one class of pharmacists and compel these to be professional men, by an educational standard which is high enough to remove excessive competition and to enable every pharmacist to obtain a professional remuneration for truly professional work.

It must be frankly conceded that the average American druggist is not a professional man. To make the professional pharmacist—not the individual, but the class—possible, the ranks of the druggist must be well nigh decimated. This cannot be done by a system of concessions nor by any other form of commercial protectionism. It can be accomplished only by demanding a **high educational standard**, which will bar all but the very best. Legislation will have to assist in bringing about this result, but it is primarily a matter of education. Legislators and the people at large must first feel the need of such requirements before they can be demanded. First of all the schools and colleges of pharmacy must create a nucleus of educated men willing to devote their lives to a profession which remains largely to be created.

Many changes have been announced in pharmaceutical education during the past year. The one which has attracted the greatest attention is no doubt the extended use to be made of the degree of doctor of pharmacy. In Europe this degree evidently has come entirely into disrepute. In this country it has survived, but has had only a questionable merit. Now it is to come to an unprecedented honor and to kindle into flames the remaining spark in the ashes of ruined pharmacy. Whether the wide-spread use of the doctor's degree in pharmacy will have this effect or whether it will contribute to the degeneration of the doctor's degree in general, time alone can decide.

A more modest but all the more genuine method of improving the general status of pharmacy is being tried with no mean success. Several large state universities are now offering courses in pharmacy equal in educational value to the other four years' courses of these institutions. This alone can place the pharmaceutical student on a par with his fellow student at the university, and later with such men in other walks of life, as have enjoyed a liberal education.

Those who favor a liberal education of the pharmaceutical student certainly have good reason to rejoice in spite of the present low status of pharmaceutical education in general. The fact that the number of pharmaceutical educators who favor the abolishment of apprenticeship and the substitution of a good secondary education in its place is growing in an entirely unexpected manner, is certainly most encouraging. Even the staunch defenders of the old system are providing loopholes, through which the non-experienced student may creep. That some of these schools are adding to their curricula, though principally in the extension of their evening lectures, will no doubt help in advancing pharmaceutical education in general.

Americans are apt to consider that European institutions and customs are crystallized so thoroughly that changes are next to impossible. This is by no means peculiar to Europe. Harvard and Yale to-day close their doors to women, while German universities are opening theirs. German university professors are among the strongest advocates for the admission of women, not only to the university but to the examination for the doctor's degree as well.

Gymnasia are being erected to prepare German girls for university studies. The minister of education himself is ready to encourage the admission of women to pharmacy. All of this in conservative Germany with its tradition to the contrary.

Our pharmaceutical colleges of fifty or at most seventy-five years' standing have been very slow in introducing laboratory methods of instruction. It is but a year that the oldest college has required a very small amount of laboratory work in botany. Equally slow are these older colleges in introducing other modern scientific methods of teaching, and discarding quasi-educational remnants of the past. The year just ended, however, goes on record as a compromise landmark in this respect.

Whereas the German pharmaceutical professors at Russian universities have been given their passports, Germany herself is awakening to the need of better pharmaceutical education in the imperial capital. A docent in pharmaceutical chemistry has been appointed at the University of Berlin. Let us hope that the dreams of Prof. Flückiger and others who have at heart the welfare of pharmaceutical education may soon be realized in that country in which a realization of the same is best possible. Hessia (Marburg) and Switzerland (Bern) have set examples for Europe, which Prussia cannot ignore. The University of Berlin cannot long afford to have a pharmaceutical institute second to those of provincial universities, it must soon have the very best of all.

We may well rejoice in this hope because its realization will prove most beneficial to American pharmaceutical institutions. The number of American students abroad in almost all departments of science and art is very large. American pharmaceutical students at German universities however have been few and far between. The articles on German universities that appeared in this journal during the past year have assisted in calling the attention of the pharmaceutical students to the facilities for study offered at these venerable seats of learning. Those who go abroad will return stimulated by the scientific atmosphere that pervades German university laboratories.

The more Germany can offer to American pharmaceutical students, the more will pharmacy in America profit. It is to be regretted that the American Pharmaceutical Association is so slow in recognizing its opportunities by sending deserving young men abroad for study and research.

Pharmaceutical legislation like pharmaceutical education in this country is in its infancy. The results of a quarter of a century of pharmaceutical legislation have been admirably reviewed by the authoritative pen of Dr. Hoffmann. (Rundschau, '95, p. 99.) It has been pointed out that the faults of all pharmaceutical legislation in this country arise from one of two causes: i. e. ignorance of both legislators and pharmacists in this important field of jurisprudence, and lack of power or negligence on the part of the authorities to execute the laws.

Optimists have expected that these laws would prove a panacea for all pharmaceutical evils and they were of necessity disappointed. To be equally pessimistic now and claim that no good whatever can result from pharmaceutical legislation would be equally foolish.

Even if our laws had been perfect in theory, their application on account of the second cause mentioned above would have been faulty. Yet it is certainly preferable by far that pharmacists inexperienced in legislative matters should control their own profession, however faulty, than that lawyers or physicians, as is the case in Germany, should become their superiors. To have one profession controlled by another is most pernicious, and is detrimental to both.

The American pharmacist has had to go through a school of legislative experience. It is to be hoped that some at least have profited by the same and are able and willing to give us better laws and a more rigid and common sense enforcement of them than we have had in the past. Whereas the Ohio Food and Drug Commission has enforced the laws in a most barbarous fashion, exposing everything to the public gaze and curiosity, Wisconsin has during the past year in a more friendly and educational yet forcible manner demonstrated that the laws in this state are not altogether a dead letter.

One of the grave faults of all pharmaceutical legislation in this country has been the laxity of educational requirements of prospective pharmacists or assistant pharmacists. The educational standard has almost entirely if not entirely been left to the State Boards. Many if not most members of these boards were and still are totally ignorant of methods of examination, if not even of the rudiments of scientific pharmacy.

The result has been that quiz-compends and books of like educational detriment have been recommended to and used by pharmaceutical candidates. Inasmuch as not even more than 10% of the druggists are graduates it can surprise no one that really little genuine educational advancement has been effected by pharmacy laws.

It would seem that the State Board of New Jersey has for the first time recommended a course of study to its prospective candidates. Even if the requirements of this course are very modest, it is to be hoped that it may prove the stepping stone to something better. If such an examination were placed in the hands of a physicist, a botanist, a chemist, and a practicing pharmacist instead of being left entirely to practicing pharmacists, the result might be encouraging indeed. The last legislature of Wisconsin has also taken a step in advance. The amended law of this state places a premium on a fairly thorough pharmaceutical education by permitting graduates of the University of Wisconsin "and other schools offering a similar course," to present themselves for the licentiate examination after two years of practical experience. The new State law of Illinois requires a registration of apprentices.

Thus, in spite of the ineffectiveness of much pharmaceutical legislation, a calmer and more experienced sentiment is pointing the way to better and more efficient legislation. Not until every State law demands a high educational standard can much good be expected from pharmaceutical legislation.

The attempts of the **American Pharmaceutical Association** during the last three years to legislate in the line of pharmaceutical education have utterly failed. They have simply increased the strife existing between factions trying to secure legislation favorable to one party but ruling out the other. Such legislation, it is true, will bind no college, but it may be used as an advertisement by those favored. This strife will not cease until the American Pharmaceutical Association recommends a course which all schools and colleges may honestly strive after. Let other courses of whatever nature take care of themselves. Judging from past experience it might be best if the American Pharmaceutical Association abstained from all similar legislation. It would sometimes appear that the best results which the American Pharmaceutical Association accomplishes is the bringing together of its members in a pleasant outing.

Most **state pharmaceutical associations** have for some years come to this view of association meetings. The business meetings are kept up and some show is made in the reading of papers, but the prime object of attendance with most druggists is to enjoy an annual outing with cheap railroad fares. In many States the greater part of the day is given to a great "Kirmiss." The number of prizes offered at one meeting during the past year was almost equal to the number of druggists in attendance, including their ladies. The druggists or rather the drummers acting under the auspices of the druggists' association, gave the town a free show and plenty of material for cheap talk. It is not surprising that the better element of the city was disgusted, and that physicians looked at the spectacle with a superior and derisive air. Such state associations are doing their very best to lower themselves in the eyes of everyone. That the public feels as safe in buying from the cutter and the department store as from such people is not surprising. Many of the better element stay away in disgust. It is to be hoped that those who have a sense of professional pride and the interest of their calling at heart will come forth and use their influence to wipe out this evil.

The year following the issue of the seventh edition of the United States Pharmacopoeia witnessed the publication of revised editions of most of the standard American **text and reference books.** Nevertheless the year 1895 has not only brought new editions of older works, but has also impressed its stamp upon the title pages of several new ones. That German books should nevertheless outnumber the American in no small ratio is not surprising.

Not only are pharmaceutical books and journals as well as schools on the increase, but the number of **new drugs, chemicals, and pharmaceutical preparations** is increasing in an almost frightful manner. If the pharmaceutical student were to study each and every one separately he might justly become despondent. Fortunately the scientist's knowledge grows with the number, so that he can generalize and classify more thoroughly. If the physical and chemical properties of the elements are functions of their atomic weights and if their physiological effect is due to chemical action, then the physiological properties of the elements must also be functions of the atomic weights. If the physical and chemical properties of a compound are due to its structural composition, the physiological properties must likewise be dependent on the same. This has been recognized for some time and is not a thing of yesterday as some American writers seem to imply. Not only have the physiological properties of the elements, rare as well as common, been studied at Tübingen, the home of the periodic system, but pharmaceutical chemists in Germany have already devised methods for the preparation and purification of no small number of their compounds. It can only amuse our European colleagues that a pharmacist in America has, at this late hour, discovered the possible use to which the hitherto useless rare elements can be put in pharmacy.

Not only chemistry, inorganic as well as organic, is increasing our materia medica, but the vegetable kingdom, which had come somewhat into discredit as a supplier of medicine, is newly asserting itself. Forms of life practically unknown to our grandfathers and dreaded by our parents, are to-day giving up their own antidotes to suffering mankind.

Bacteriology, next to chemical therapeutics, is probably doing more at present than any other science to place medicine on a truly scientific basis. Not only has she taught the cause of many a disease and the methods of combatting diseases due to bacteriological action, but she has in recent years, supplied the healing art with several new remedies produced by bacteria. If it is the duty of pharmacy to prepare and dispense the remedies which the physician prescribes, then the preparation of the new bacteriological remedies is a legitimate field for new activity on the part of the pharmacist. The Fliegende Blätter no doubt fully grasped the situation in their mock illustration of Dr. Behring as Apothecary, showing the illustrious Berlin professor behind the counter of a drug store, selling the serum on tap from a live horse, while children and nurses, peasants and artisans with pitchers and beer mugs stand about clamoring for the life saving antitoxine.

The real situation is not quite as humorous. A frightful majority of pharmacists are totally ignorant of bacteriology. Even in Germany the average pharmacist could not be entrusted with the preparation of bacteriological remedies, if this were practicable. The Farbenfabriken and other chemical factories of Germany and the large pharmaceutical establishments of this country are supplying the physician to a large extent directly with these new remedies. This is another illustration of how pharmacy is being outstripped by other sciences. Chemistry and botany, whose cradles stood in the pharmacies of the fatherland, have long ago outgrown their common parent. Although a great deal has been said about the importance of bacteriology as a part of a pharmaceutical curriculum, yet very few schools of pharmacy in this country, and not one of the older colleges of pharmacy, have offered bacteriology even as an optional study. If the rank and file of American druggists know nothing about bacteriology, can it be surprising that only the pharmaceutical manufacturer reaps the harvest from this new field of truly pharmaceutical activity.

It would be wrong, however, to suppose that every pharmacist of the future must be an expert bacteriologist. Chemistry has not succeeded and possibly never will succeed completely in replacing vegetable drugs. It is not to be supposed that bacteriology will replace chemistry. In fact the present methods of preparing so-called bacteriological remedies are very crude indeed. As yet we know very little about the active principles of the same. After the physiological chemist has isolated the active constituent or constituents of these serums, the synthetic chemist will teach us how to derive these powerful remedies from more convenient sources than horses or sheep. Then the time will have arrived when the retail pharmacist, though he may not make all or any of these preparations himself, will be in position to control the purity of these remedies. It is to be hoped that pharmaceutical educators will anticipate this time and give their students an opportunity to become familiar with bacteriological methods and products, so that when called upon they may assume this responsibility.

In Memoriam. The recorder of pharmaceutical events of the past year is fortunate in being able to state that none of the leading pharmaceutical scientists have been taken from their fields of activity by death. The decease of the noble Professor Flückiger at the close of the year 1894 has been kept fresh in our memories through biographical sketches, of which those of Professor Tschirch (Berichte der Pharmaceutischen Gesellschaft) and of Prof. Schaer (Archiv der Pharmacie) are particularly interesting and valuable. Both writers had not only been closely associated with Prof. Flückiger for a long number of years, but also at present occupy positions at Bern and Strassburg respectively, which Prof. Flückiger occupied as teacher before them.

Sciences correllated to pharmacy have been less fortunate during the past year. Chemistry has lost its Lothar Meyer of periodic system fame. It is not much more than a year ago that Prof. Meyer wrote a biographical sketch of his deceased friend and former assistant at the University of Tübingen, Prof. Eugen Lellmann, for the "Berichte" of the German Chemical Society. No one then surmised that the master would so soon follow his disciple.

Physiological chemistry has also suffered loss through the death of Prof. Hoppe-Seiler of the University of Strassburg; physiology lost its veteran Prof. C. F. W. Ludwig of the University of Leipzig. James Dwight Dana, a scientific explorer of the Pacific and Antarctic Oceans and for forty years professor of geology and mineralogy at Yale, who died in his 82d year, was a prominent representative of American scientists and authors. Prof. Huxley, who assumed the duties of professor of natural history and physiology at the Royal Institution in the same year in which Dana was called to Yale, died about two months later. As philosophical writings his works are of more than passing interest. When the history of the relation of science and religion of this century is written Huxley's name will not have suffered through age.

France also mourns over one of her illustrious sons, one of the founders of a truely modern science, bacteriology. The hero-worship of the French for their dead of international fame is reiving a check from the pens of German scientists. Abstracts from older German journals are published demonstrating the fact that Pasteur was more fortunate in applying the observations of other scientists than as an original observer. The apotheosis of everything foreign on the part of Germans appears to have ceased with the development of German science. The unification of Germany in the realm of intellect initiated by von Stein had to be accomplished while political unity was still the patriot's dream. Illustrative of the end of the transition period is a paragraph from a letter written by Liebig to Wöhler in August 1870. Liebig writes from Munich: "Pasteur besuchte mich vor dem Kriege; er sprach mit solcher Verachtung von dem Könige von Preussen und dessen Anmassung, auf die Forderungen Napoleon's hin nicht zu Kreuze gekrochen zu sein, dass ich wahrhaft empört war." This, however, need not imply that Liebig did not understand, or undervalued, the eminent services Pasteur had rendered as a scientist. In Pasteur's work natural science applied has celebrated some of its greatest victories.

Although professor of chemistry at the *k. k. technologisches Gewerbemuseum* the death of Dr. Richard Godefroy has affected pharmacy directly, since for nine years he taught at the pharmaceutical school of the *Allgemeiner oesterreichischer Apotheker-Verein*, and for several years was its director. Though he died in the prime of life his work had met with general recognition throughout Europe.

Although the year 1895 will not go on record as the first of a pharmaceutical millenium, yet in looking back upon the year as a whole, the American pharmacist has good reason to feel that he has not labored in vain. The number of druggists is still too large to make pharmacy very profitable to any but a favored few. The present educational standard is still too low to permit of calling the American druggist a professional man. But there are exceptions and it is to be hoped that the exceptions may some day become the rule. Most pharmaceutical journals emphasize the business phase of the druggists' calling. In scientific productions American pharmacy is still far behind German pharmacy. Pharmaceutical education is still in its infancy. And yet, withal, the general atmosphere breathes progress. An enormous progress, however, is necessary. The general sciences have far outstripped the pharmaceutical sciences. The professions of medicine and engineering have developed more rapidly than pharmacy. That pharmacy has progressed while it was being outstripped by chemistry and botany is but poor comfort. Progress is relative and such progress implies retardation. If pharmacists would only look at the last century of their history in this light, it should not depress their spirit, nor make them despondent or pessimistic, but should stimulate them to unprecedented activity. We must learn to compare ourselves, not only with our forefathers and rest content that we have been moving onward, but with those about us. The American pharmacist, enjoying an independence from the medical profession such as the apothecaries of Germany cannot boast of, should not rest content with this equality before the law, but should strive to make his calling the peer of any learned profession of this country. This is the only standard by which he can hope to conquer. He who fights under this standard may derive new inspiration from the past year, though his path has not been smooth and though he has met not only with honest battle, but with foul play as well. Like the Knight Templar he must use both trowel and sword in the redemption of his profession.

The Pharmaceutical Review in its new garb will cling to its old principles. It sends New Year greetings for the first time in the English tongue not only to its old friends, but also to the many new ones that it soon hopes to find. Though the German language did not bar it from being truly national in its character, it hopes that the English tongue will assist in making it outwardly as well as in spirit American. *E. K.*

ORIGINAL CONTRIBUTIONS.

On Bismuth Subnitrate.

By Professor *Charles O. Curtman*, of St. Louis, Mo.

(Report No. 9 of the *Research Committee B*, U. S. P. Revision.)

It is well known that by treating bismuth nitrate, $Bi(NO_3)_3$, with water, very different products of bismuth subnitrate are obtained. The amount of water added, the temperature, the length of time the precipitate remains in contact with the liquid before filtering, the duration of washing and the quantity of water used in that operation, and finally the temperature and time of drying the finished product, all have their influence in producing salts of various compositions. Many of the precipitates are shown by the microscope to consist of minute crystals, so that they must be considered as definite chemical compounds, while others are amorphous. To secure products of uniform composition some pharmacopoeias give careful directions for the preparation, while others leave the choice of method of preparation to the manufacturer and confine themselves to prescribing tests for purity. The U. S. P. describes the salt as "of variable chemical composition" and its tests for purity refer to the absence of foreign metals, especially of lead, silver, copper and arsenic, also of ammonia, alkalies and alkaline earths, and of carbonate, sulfate and chlorid.

The only quantitative tests relating to the proportion of its normal constituents are implied in the description of the salt, which states that, when heated to 120° C., it loses water (from 3 to 5 per cent. of its weight) and when subsequently heated to redness, it leaves from 79 to 82 per cent. of its weight of a yellow residue. Hence when a salt complies with the tests for absence of foreign materials, a considerable limit is allowed in the relative proportion of nitrate, hydroxid and water.

The larger modern works on chemistry give numerous different formulae of bismuth subnitrate found by recent and older investigators, together with the conditions under which their formation was observed. Thus Dammer's Handbook enumerates nine, Michaelis seven, and in Flückiger's Pharmaceutical Chemistry we find three principal formulae distinguished as α, β and γ.

For some time past I had observed that of several specimens received for examination, none conformed exactly to any of the formulae published, most of them being deficient in acid. Few came within the limits of quantitative proportions stated in the U. S. P. which are the same as those of the German *Arzneibuch*, although in qualitative examination they complied with its demands. Of course the mistake of using tinfoil in Bettendorff's test for arsenic, to which I called attention about two years ago, was avoided, the concentrated solution of stannous chlorid being used alone.

For the purpose of investigating the subject more fully, I procured specimens from some of the principal manufacturers and determined in them not only the freedom from impurities, but also the loss of water by heating to 120° C. and the amount of residue of bismuth trioxid left on ignition, and lastly the percentage of nitric acid.

To facilitate the comparison of results, I give the proportions demanded by Flückiger's formulae:

$\alpha = BiONO_3 + H_2O$ [or as written by others: $Bi(OH_2)NO_3$] representing the salt as first precipitated.

$\beta = BiOOH + BiONO_3$, the same salt after protracted washing.

$\gamma = (BiONO_3)_4 + H_2O$, the salt formed by long contact with acid wash water.

Another formula contains the salt β with water: $\beta^1 = BiONO_3 + BiOOH + H_2O$.

Other published formulae demand a still larger proportion of nitric acid and need not be considered here.

These four contain as follows:

	Per cent. water lost at 120° C.	Per cent. Bi_2O_3 after ignition.	Per cent. NO_3, nitric acid radical.
α	5.894	76.413	20.311
β	—	88.101	11.709
γ	1.54	80.80	21.247
β^1	3.286	85.206	11.324

The seven specimens examined were all exceedingly light and voluminous, and would pass muster in regard to the qualitative tests of the U. S. P.

	Per cent. of loss at 120° C.	Per cent. of residue Bi_2O_3.	Per cent. of acid radical (NO_3).
1.	4.1	82.0	10.80
2.	5.9	82.5	11.45
3.	5.3	83.1	10.21
4.	3.2	85.0	9.90
5.	3.1	81.2	10.53
6.	3.0	82.0	11.45
7.	3.2	81.1	10.53

For the determination of the nitric acid several volumetric methods were tried on the same sample, and after finding that they gave substantially equal results and agreed well with some colorimetric tests, the following was adopted as the most expeditious for the examinations.

6.189 gm. (corresponding to the molecular value of the acid radical NO_3) of the bismuth salt were suspended in 100 cc. of water at ordinary temperature, a few drops of phenolphtalein T. S. were added, and then normal solution of potassium hydroxid, in small portions with vigorous shaking until the red color remained permanent for ten minutes. The number of cc. of normal solution used directly indicated the percentage of NO_3. (If only 1 gm. be taken, the number of cc. of solution used must be multiplied by 6.189 to obtain the percentage of NO_3).

The results show that Nos. 2, 3 and 4 exceed the limit of residue of Bi_2O_3 given in the U. S. P. (and in the German *Arzneibuch*); also that Nos. 2 and 3 lose more water at 120° C. than prescribed. The water lost at that temperature is the more loosely combined water of crystallisation, while the separation of the water formed from the hydroxid requires a higher temperature.

The specimens examined are nearly all more basic than is demanded by the four formulae above given. All of the other formulae enumerated in the books require still more acid. So that we must either consider our commercial products as having more basic formulae, or else that they are mixtures in indefinite proportions of bismuth hydroxid with the real subnitrate. The latter is most likely the correct view. For the calculation of the actual proportions leads to formulae of such complexities, that it is not likely that they have any existence in fact. The crystalline appearance under the microscope does not necessarily indicate that we have but a single salt, but may be due to successive crystalline deposits of salts of different compositions, varying in proportion according to the different methods of manufacture.

Clinical experience with these more basic preparations can alone decide whether they are sufficiently useful to recognize them by enlarging the pharmacopoeial limits, so as to include them in the official standard.

While experimenting with the above and other specimens I experienced a difficulty that may be of sufficient interest to mention. One of the tests prescribed in the U. S. P., not only for bismuth, but also for several other metallic salts, directs that after precipitating all of the metal by hydrogen sulfid from acid solution, the filtrate should leave no residue on evaporation. During the continued drought of last summer the atmosphere in my surroundings so abounded in very fine dust, that it was impossible to evaporate even the purest alcohol or distilled water without a residue. After heating over the Bunsen flame on platinum foil they invariably left a very slight yet distinctly visible ring on the polished surface. All of the specimens tested left a similar trace of residue. Having found that this did not necessarily indicate an impurity in the salt, but was due to temporary atmospheric conditions, I disregarded it. On repeating the evaporation during a spell of wet weather, the same distilled water left no stain behind.

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Further Experiments with Wild Cherry Bark.

By *Dr. Alfred R. L. Dohme and Dr. Hermann Engelhardt.*

In a previous publication upon this subject * we stated that we would take up this work on a more extensive scale this winter in order to ascertain if there were any definite or even approximate rule as to the relative yield of hydrocyanic acid contained in the bark of old wild cherry trees, (*i. e.* brown or "rossed" bark) and in the bark of young wild cherry trees, (*i. e.* green or virgin bark). It will we remembered that Prof. A. B. Stevens of Ann Arbor found that the thick brown bark was richest while our results indicated that the thin green bark was richest in hydrocyanic acid. In order to get a more general grasp of the subject, we obtained samples of *Prunus virginiana* from Dr. E. R. Squibb of Brooklyn, Prof. J. U. Lloyd of Cincinnati, and from three firms in the city, Messrs. Muth Bros. & Co., Gilpin, Langdon & Co., and Higgins & Waters. To all of these gentlemen we wish to express our thanks for their courtesy. We at once sent a duplicate set of all of these samples to Prof. Stevens and we await his results with them with interest.

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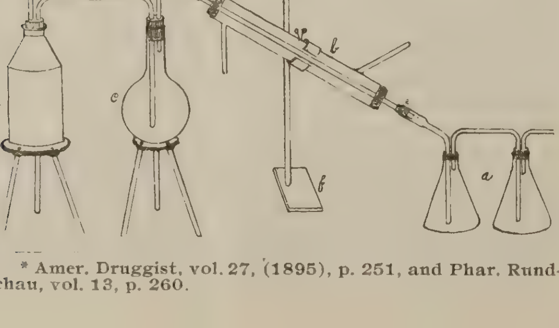
* Amer. Druggist, vol. 27, p. 251, and Phar. Rundschau, vol. 13, p. 260.

Prof. Lloyd's samples were gathered in Ohio, those of Messrs. Higgins & Waters in New York state and the rest in Virginia and other southern states. The samples of Prof. Lloyd possess an additional interest in that they were all taken from one tree and from three parts of it, being (1) Bark of Root, (2) Bark of Tree and (3) Bark of Twigs. The results obtained from them are not, strictly speaking, comparable with the brown and green classification, as the bark of the tree was also green and comparatively thin. We will hence put these in a series for themselves. The common bark sent by Dr. Squibb was old and brown to be sure, but old rather in the sense of having been stored a long time than in having been formed on the tree earlier.

It appears that in copying our results in the article published during the month of November,* we got the methods I. and II. mixed. The figures for method I. belong to method II. and vice versa. This has no effect upon the conclusion in reference to the relative value of the two kinds of bark, but reverses the conclusion drawn as to the relative value of the methods employed. There is little difference to be sure in any case between the two methods given, but what difference there is points to the superiority of the titration over the gravimetric method, thus confirming what Prof. Stevens observed in this particular. Besides the fact that it indicates more hydrocyanic acid, the titration method has the double advantage of being more expeditious and much less troublesome. For this reason we have omitted entirely the results obtained by the gravimetric method of weighing the metallic silver which results from heating the silver cyanide in a reducing flame.

Our results, as will be seen below, confirm those we obtained before and indicate that the green thin cherry bark is really richer in hydrocyanic acid than the thick brown bark, thus substantiating the "taste" test; for it is a well-known fact, that the green bark possesses as a rule a stronger and more acid taste than the brown bark. The distillation was carried on as indicated by us in our former paper and we have become convinced that live steam at 100° C. will drive every trace of hydrocyanic acid out of wild cherry bark in less than twenty minutes. Our apparatus used is given in the figure below:—



Distillation.

d is a tin can half filled with water and closed by a two-holed cork supplied with two glass tubes, one of which dips below the surface of the water and the other connects the can with a liter glass Florence flask *c*, through a double-holed rubber stopper. The tube connecting the latter with the can dips below the surface of the liquid in the flask and the other tube in the flask connects it with the long Liebig condenser *b* through which cold water is of course rapidly flowing during the process. The condenser is supported by a stout iron stand *f*, being firmly clamped to the latter by an iron screw clamp. The end of the condenser tube is connected with a small Erlenmeyer flask *a* by means of a glass tube attached to it by a piece of rubber tubing *e*, the glass tube, which is bent, dipping below the solution of caustic alkali contained in the flask. This flask is connected with another similar flask also containing caustic alkali solution and attached merely for safety's sake so as to catch and absorb any hydrocyanic acid that might pass through the first flask undissolved.

The assay is carried on as follows:—10 grams of wild cherry bark, ground to a No. 40 powder, are allowed to macerate for twenty-four hours with 100 cc. of distilled water in a 250 cc. corked Erlenmeyer flask, shaking frequently. The entire contents are then washed into the liter flask *c* by means of distilled water and the flask *c* then securely corked with the two-holed stopper already described. The water in the can *d* is then heated to boiling and as soon as steam comes over into the flask *c* this is also heated by a Bunsen burner placed under it. Distillation is continued about twenty minutes and the flask *a* then removed as well as the burner under flask *c*. Some of the distillate is then caught up in a clean test tube and the flask *a* again attached to the condenser by means of the rubber tube *e*. To the contents of the test tube a few drops of a solution of a mixture of ferrous and ferric salts are added, the mixture made alkaline with caustic soda until a permanent bluish-green precipitate is formed, and then heated gently. On adding an acid, to acid reaction, a light brown or a light blue color may result; in the former case there is no more hydrocyanic acid present and in the latter case there is still some hydrocyanic acid present. This reaction is capable of detecting hydrocyanic acid in dilutions of one to fifty thousand parts of water.*

Titration.

A decinormal solution of silver nitrate is made and a endiometer graduated to tenths of a cubic centimeter filled with it. The contents of both flasks *a* are poured into a large beaker and a decigram of sodium chloride added and dissolved in the liquid. The silver solution is added until a permanent milkiness results, due to the formation of silver chloride. Read off the number of cc. of silver solution used and multiply by two, as half of the potassium cyanide present is used up in dissolving the silver cyanide formed, to form a soluble double salt. From this it is easy to calculate the amount of hydrocyanic acid present. By this method the distillation proceeds under normal pressure, and hence temperature, whereas in Prof. Stevens' method the thistle safety tube introduces a slight pressure resulting in a slightly higher temperature. This may not however affect the result. The main preference of our method with live steam is double saving of time, — first, because it actually occupies one twentieth of the time required to make a complete distillation by Prof. Stevens' method, and second, because one can perform other work while it is going on, while Prof. Stevens' method requires constant watching for several hours.

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* Amer. Druggist, vol. 27, (1895), p. 251, and Phar. Rundschau, vol. 13, p. 260.

* Beilstein's Handbuch, Bd. I, p. 1411.

Results.

Most of the barks examined are very poor, at least as compared with what we have examined previously, although as before stated, the bark of root of the samples from Prof. Lloyd is normal or rather above the average.

	Thick Brown Wild Cherry Bark.	
1	Squibb—"common bark"...	a—0.0782% HCN.
		b—0.0831% HCN.
2	Muth—"brown bark".........	a—0.0636% HCN.
		b—0.0782% HCN.
3	Lloyd—"bark of tree"........	a—0.1760% HCN.
		b—0.1736% HCN.
4	Higgins & Waters—"rossed bark"...........................	a—0.1565% HCN.
		b—0.1565% HCN.

	Thin Green Wild Cherry Bark.	
1	Squibb—"young bark"......	0.22% HCN.
2	Muth—"virgin bark".........	0.1418% HCN.
3	G. L. & Co.—"green cherry"	0.1565% HCN.
4	Lloyd—"bark of twigs".....	a—0.115% HCN.
		b—0.117% HCN.
5	Higgins & Waters—"green cherry".........................	a—0.166% HCN.
		b—0.167% HCN.

The results obtained gravimetrically, which we have not recorded, agreed with those obtained volumetrically, although in nearly all cases somewhat lower than the latter. We believe this is due to the fact that hydrocyanic acid does not as readily decompose silver nitrate as it does caustic potash and some may be lost on this account. As we cannot recommend the gravimetric process in any particular, and it gives lower results, we have discarded it entirely. As a comparison of the various parts of the tree *Prunus virginiana* we have from Prof. Lloyd's three samples:

Bark of Root of Wild Cherry.....	a—0.3423% HCN.
	b—0.3423% HCN.
" " Tree " "	a—0.1760% HCN.
	b—0.1736% HCN.
" " Twigs " "	a—0.1150% HCN.
	b—0.1170% HCN.

This indicates very strongly that the bark of the root is richer than that of the tree and this in turn richer than that of the twigs.

If we leave out the samples of Prof. Lloyd as not being strictly gathered in accordance with the thick brown and thin green requirement, since both were comparatively thin and green, and also the "common" bark of Dr. Squibb which is hardly a thick brown bark, we must conclude as we did formerly* that the thin green or young bark is richer in hydrocyanic acid than the thick brown or older bark.

The two processes of distillation were tried on the same sample of bark in several cases and never once could we get as much hydrocyanic acid by Prof. Stevens' method as we did by our own, although we distilled the same sample five times as directed by him. We further observed that practically all the acid came over during the first distillation as all that came over during the second distillation required two drops of decinormal silver solution to completely unite with it and all that came over during the third distillation required but one drop of decinormal acid solution. Both of these quantities are practically insignificant. The fourth distillation yielded us no hydrocyanic acid. We hence conclude that the method using live steam besides being simpler and more expeditious is also fully as exact if not more so.

Since this process of assay is so simple and easily manipulated and since the above investigation has shown that the various parts of the plant vary so much in the amount of hydrocyanic acid they contain and since the virtue of wild cherry bark is generally believed to reside in the hydrocyanic acid it contains, does it not seem rational to conclude that a hydrocyanic requirement and a process of assay for *Prunus virginiana* are desirable additions to the United States Pharmacopoeia? Whether or not wild cherry bark is a therapeutically valuable drug is another question and does not concern us, inasmuch as the drug is used to a very large extent and might as well be dispensed of a nearly uniform strength, since this can so readily be ascertained.

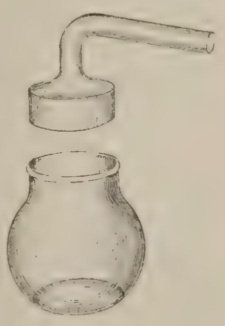
Baltimore, Dec. 17, 1895.

New Laboratory Apparatus.

By *Edward Kremers.*

Combination Weighing and Distilling Flask.

The *Abdampfkolben* or evaporating flasks are very convenient in certain processes of pharmaceutical assaying. When comparatively large quantities of ether or chloroform are used and numerous assays are made they, however, have one disadvantage, viz. that the solvent cannot be recovered. Inasmuch as the etheral or chloroform solutions can just as readily be distilled from a water bath as evaporated, there is no reason why pounds of ether or chloroform should be wasted.



By replacing the ground glass stopper of the evaporating flask by a ground glass still head, the evaporating flask is easily converted into a distilling flask. After the solvent is largely recovered by distillation the residue can be completely dried by removing the still head, placing the flask in a desiccator or continuing the application of heat from a water bath. In some instances it may be desirable to weigh the still head with the flask. In order to do this the tube may be shortened if it is not considered best to use a large bell jar desiccator. When numerous assays are made at one time a battery of condensers and flasks can readily be constructed.

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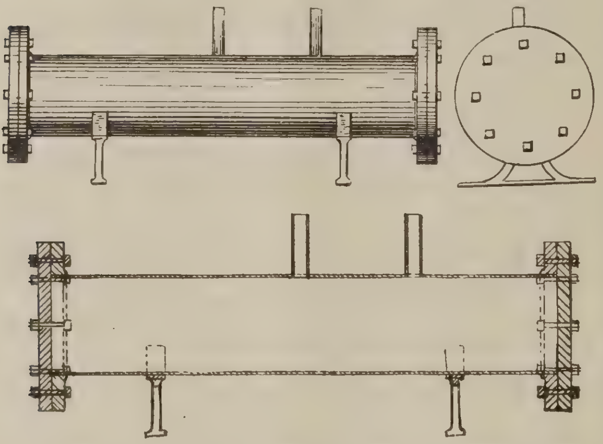
* loc. cit.

Two of these combination distilling and weighing flasks were kindly made upon request by Mr. C. Gerhardt, of Bonn, Germany, at a cost only slightly greater than that of the ordinary evaporating and weighing flask.

Laboratory Still for Tar.

Chemists who have had occasion to distill tar for one purpose or another in organic laboratories with ordinary equipment, no doubt have frequently been perplexed as to how to secure a comparatively cheap, yet efficient still. Glass retorts will not do as a rule on account of the water contained in the tar and the bumping caused thereby. Good copper retorts of satisfactory size are expensive and ofttimes not readily obtainable. A still of wrought iron pipe, however, can be readily made even in small cities. Such a still has given satisfaction during the past year in the distillation of pine tar and for the sake of others may deserve description. Students while working with charges of from 10 to 20 K^{o} of tar, have not met with a single accident.



This particular still was made of a piece of 8 in. wrought iron pipe, 40 in. long, threaded for an inch at each end. Both ends are fitted with cast iron flanges, 14 in. in diameter and ¾ in. thick. Heads of same diameter and thickness are bolted to the flanges by ⅜ in. × 2 in. bolts. Two 1 inch pipes lead out of the top of the still. One is used as exit tube for the distillate, the other as a safety tube. The still rests upon two cast iron legs, its center being 12 inches above the floor. It is heated by a low gas furnace. Large bottles surrounded by cold water are used as condensers.

MONTHLY REVIEW.

Chemistry.

Preparation of Potassium Ferricyanide.

(G. I. P. No. 81927.)

To a warm concentrated aqueous solution of potassium ferrocyanide C. Bech adds an aqueous solution of ammonium persulphate so that the reduction product will separate upon cooling in the form of a crystalline precipitate of potassium ammonium sulphate.

1 Ko. of potassium ferrocyanide is dissolved in 1 Ko. of hot water and the solution allowed to cool to 60°. To this liquid a cold solution of 270 g. of ammonium persulphate in 500 g. of water is gradually added, the mixture being cooled at the same time. Under these conditions the potassium ammonium sulphate will crystallize whereas the ferricyanide remains in solution.

[Zeitsch. f. angew. Chem., 1895, p. 386.]

Preparation of Sodium Sulphate.

(G. I. P. No. 82443.)

In order to utilize sodium acid sulphat for the manufacture of normal sulphate, according to R. E. Chatfield, a solution of the former is neutralized with an aqueous solution of ammonia (e.g. from gas works), sodium ammonium sulphate resulting. This salt though stable under certain conditions is unstable under others, thus enabling a separation of its dissociated components.

For the conditions under which Na_2SO_4, $Na_2SO_4 . 10H_2O$, $Na(NH_4)SO_4$ and $(NH_4)_2SO_4$ will separate from this solution see the original.

[Zeitsch. f. angew. Chem., 1895, p. 463.]

Preparation of Sodium Bicarbonate.

(G. I. P. No. 81103.)

According to E. Carthaus, magnesia (resp. dolomite) can be brought into solution as magnesium bicarbonate by acting upon it with carbon dioxide and water under a pressure of 5 to 6 atmospheres. If this solution is acted upon by sodium chloride, also under pressure, double decomposition takes place, magnesium chloride and sodium bicarbonate being formed. The latter is largely precipitated, whereas the magnesium chloride, being very soluble, remains in solution. These reactions are repeated separately in suitable apparatus, the materials being forced under pressure from one vessel into the other until the mother-liquid becomes saturated with magnesium chloride. The sodium bicarbonate is washed to remove the impurities of the mother-liquid.

[Zeitsch. f. angew. Chem., 1895, p. 383.]

Preparation of Boric Acid and of Borax.

(G. I. P. No. 81886.)

For the preparation of these chemicals the firm of Bettenhausen, Marquardt & Schulz recommends a modification of patent 72012. If boronatro calcite is boiled with an aqueous solution of sodium bisulphite all boric acid is dissolved in the form of sodium borate, whereas the calcium remains undissolved as sulphite:

$$(Na_2O.2B_2O_3 + 2CaO.3B_2O_3) + 2NaHSO_3 = 2Na_2O.5B_2O_3 + 2CaSO_3 + H_2O.$$

If calcium sulphite is used the reaction is practically the same with but one exception. The calcium of the calcium bisulphite as well as that of the mineral is precipitated as normal sulphite:

$$(Na_2O.2B_2O_3 + 2CaO.3B_2O_3) + 2(CaH_2.2SO_3) = Na_2O.5B_2O_3 + 4CaSO_3 + 2H_2O.$$

Pondernute, calcium borate, when treated with sodium acid sulphite yields sodium acid borate:

$$(4CaO.5B_2O_3) + 4(NaHSO_3) = (2Na_2O.5B_2O_3) + 4CaSO_3 + 2H_2O.$$

However, when treated with calcium acid sulphite it yields free boric acid:

$$(4CaO.5B_2O_3) + 4(CaH_2.2SO_3) + 11H_2O = 8CaSO_3 + 10B(OH)_3.$$

For quantities to be used and conditions to be observed see the original.

[Zeitsch. f. angew. Chem., 1895, p. 385.]

Preparation of Potassium Chlorate.

(G. I. P. No. 81804.)

R. J. Bayer recommends the use of zinc oxide in place of lime or magnesia, because the first mentioned yields a more valuable by-product, viz. zinc chloride. The mixture of water, levigated zinc oxide (3 equivalents) and potassium chloride (1 equivalent), previously heated to a temperature of 95 to 98° in order to avoid the separation of zinc oxychloride, is saturated with chlorine. A variety of conditions must be observed to avoid the formation of undesirable products. The potassium chlorate is readily obtained by crystallization. The zinc chloride is obtained by evaporation of the mother-liquid. If a slight contamination of the zinc chloride with potassium chlorate is undesirable the latter is decomposed with an equivalent quantity of hydrochloric acid. The chlorine thus eliberated can be used in saturating fresh lots of original mixture.

[Zeitsch. f. angew. Chem., 1895, p. 386.]

Isolation of Chlorine from Gas Mixtures.

(G. I. P. No. 82437.)

According to H. Loesner, chlorine can be isolated from mixtures, such as that resulting from the Deacon process, by passing the gases through liquids that absorb chlorine but are not affected by the same. o-Nitro toluene is especially recommended for this purpose. Under ordinary pressure it absorbs as much as 11 p. c. and more. The chlorine is again given off upon application of heat or reduction of pressure. It is not necessary to employ c. p. o-nitro toluene.

Nitro benzene, the nitro xylenes, the nitro cumenes, benzene chloride or bromide, toluene chloride or bromide, chloroform, tetrachlor carbon, monochlor ethyl acetate or liquid paraffins can also be used in place of o-nitro toluene. Solids, such as p-nitro toluene, benzene dichloride, dibromide, trichloride, tribromide, the corresponding toluene derivatives and other solid compounds do not absorb chlorine at ordinary temperature.

In order to isolate the chlorine from a mixture the latter is poured through one of the above mentioned solvents, keeping the same cool. From the solution thus obtained pure chlorine can be liberated upon heating or diminution of pressure. The eliberated gas can be compressed or used otherwise.

[Zeitsch. f. angew. Chem., 1895, p. 456.]

Preparation of Alkali Phosphates.

(G. I. P. No. 82460.)

For the preparation of sodium and potassium phosphate R. Holverscheit has had the following process patented. Tricalcium phosphate is heated with a solution of alcali sulphate, the phosphate of the alkali formed by double decomposition going into solution. The tetra-basic calcium phosphate of the "Thomasschaelke" cannot be used. It is necessary to use more than the equivalent amount of alcali sulphide. The yield is furthermore increased by heating the mixture to 150° under pressure.

The process can be modified so that the calcium phosphate is fused with carbon and an excess of alkali sulphate. The fused mass is lixiviated. If sodium sulphide or sulphate have been used the sodium phosphate resulting can be obtained by crystallization. The excess of sodium sulphide in the mother-liquid is recovered by evaporation and used again, or can be converted into the carbonate with the aid of carbon dioxide.

The potassium phosphate which does not crystallize is freed from potassium sulphide by the addition of phosphoric acid, or by converting the sulphide into the sulphate or carbonate and removing then by crystallization.

The residue after lixiviation consists largely of carbon, calcium sulphide and a small quantity of undecomposed calcium phosphate. By exposing this mixture to the air the sulphide is oxidized to hyposulphite. The latter is lixiviated and with the aid of sodium sulphate is converted into sodium hyposulphite. The residual mixture of carbon, gypsum and calcium phosphate is used either as fertilizer or for the preparation of phosphoric acid.

[Zeitsch. f. angew. Chem., 1895, p. 462.]

The Occurrence of Nitrogen in Mineral Springs.

According to Prof. Erdmann the thermal springs of Bath, England, and of Talouko, Asia Minor, also the springs of Petersdorf near Vienna and of Klein-Ragoczy a. d. Saale exhale almost pure nitrogen. To this short list Dr. Cobolet adds one more, viz. the saline spring near Süll-dorf, a small town near the railroad station Osterweddingen on the division Blumenburg-Magdeburg. A sample of water taken from the spring in March contained 4.30 p. c. NaCl, 0.14 p. c. KCl, 0.11 p. c. $MgCl_2$ and 0.13 p. c. $CaSO_4$. In May a sample taken from the spring contained 4.93 p. c. NaCl. The percentage of the other solid constituents was correspondingly higher.

The amount of gas escaping is small. Twelve litres were collected in about 2½ hrs. The gas is almost free from oxygen, completely free from hydrocarbons and contains 0.25 to 0.3 p. c. of carbon dioxide. The nitrogen constituting the bulk of the gas was further identified as magnesium nitride.

The presence or absence of argon was not ascertained. On account of the greater solubility of argon in water the gas would most likely contain very little of the same.

[Zeitschr. f. angew. Chem., 1895, p. 400.]

Preparation of Potassium Ferrocyanide.

(G. I. P. No. 82081.)

When sulphocyanides of the alkalis are fused with iron, potassium cyanide and ferrous sulphide are apparently formed:

$$6KSCN + 6Fe = 6KCN.6FeS.$$

Heretofore this fused mass was lixiviated with water shortly after cooling, whereby a chemical change took place expressed by the following equation:

$$6KCN.6FeS + 3H_2O = K_4Fe(CN)_6.3H_2O + K_2S + 5FeS.$$

The sulphur of the residual ferrous sulphide is thus largely wasted, for if exposed to the air the sulphide is converted into oxysulphate of iron, which is but sparingly soluble. Only traces of free sulphur (about 0.3 p. c.) are formed. The residue therefore is worthless and accumulates.

This process has been modified by Goerlich and Hichmann so that the entire amount of sulphur is recovered in the free state. Instead of treating the fused mass immediately with water, it is first exposed to the action of atmospheric air, which contains besides the oxygen the necessary moisture and carbon dioxide to convert the alcali sulphide into carbonate. The fused mass undergoes decomposition according to the following equation:

$$2(6KCN.6FeS)+17O+21H_2O+2CO_2 = 2[K_4Fe(CN)_6.3H_2O]+2K_2CO_3+5Fe_2(OH)_6+12S.$$

In the absence of carbon dioxide the change is substantially expressed by the following equation:

$$2(6KCN.6FeS)+15O+21H_2O = 2[K_4Fe(CN)_6.3H_2O]+2K_2S+5Fe_2(OH)_6+10S.$$

The formation of alcali carbonate, however, is preferable to that of alcali sulphide. From the oxidized mass the salts and sulphur are extracted according to generally known methods. The residue can be employed in the manufacture of metallic iron.

[Zeitsch. f. angew. Chem. 1895, p. 462.]

Oxidation of Tannic Acid to Oxalic Acid.

L. Fajans, of Budapest, has oxidized tannic acid with various oxidizing agents and has in most instances obtained oxalic acid. Under certain conditions the yield of oxalic acid is so large that it seems possible to devise a method whereby tannic acid can be determined quantitatively by means of this its oxidation product. Nitric acid of 35° Bé. at a temperature of 15° has thus far given the best results. However, gallic acid is also oxidized to oxalic acid by the same agent.

Potassium chlorate and hydrochloric acid, which oxidize tannic acid to oxalic acid, convert gallic acid into intrichlorglycerine acid, $C_3H_3Cl_3O_4$. Acid permanganate, as is generally known, destroys tannic acid.

Oxalic acid also results in alkaline solution, e. g. with potassium ferricyanide and sodium peroxide.

In one experiment, in which a drop of water was added to an intimate mixture of 0.3 g. tannin and an equal amount of sodium peroxide, a violent explosion took place with the appearance of fire.

[Zeitsch. f. angew. Chem., 1895, p. 471.]

Practical Pharmacy.

Separation of Wool Fat into Cholain, Cholepalmin and Cholecerin.

(G. I. P. No. 81552.)

Melted wool fat is allowed to cool gradually to a temperature of 35°. The liquid portion is separated from the solid by expression or with the aid of a centrifuge. The same process is repeated at 40—45°, at which temperature another portion of wool fat is separated. The substances thus obtained are cholain, melting at 25—29°; cholepalmin, melting at 37—28°; and the residual cholecerin, melting at from 49—55°. The cholecerin, which contains most of the cholesterin of the wool fat, has the consistency of wax and can be used as a substitute for the same. Cholepalmin upon saponification yields fatty acids and can be used in the manufacture of candles and soaps, whereas cholain is a good lubricant.

[Zeitsch. f. angew. Chem., 1895, p. 376.]

Adulteration of Tannin.

In an article read before the German Pharmaceutical Society, F. Guenther calls attention to the fact that tannin is not only adulterated with dextrin and sugar; but that the cheaper varieties sometimes contain starch or flour, which are readily identified with the aid of the microscope. He also claims that one brand marked chemically pure, has for a number of years been grossly adulterated with sodium chloride. He has found as much as 13 to 20% of common salt. Epsom salts is said to be used for the same purpose.

[Ber. d. pharm. Gesellsch., 1895, p. 299.]

Food Stuffs.

Weighting and Conservation of Coffee.

According to A. Stutzer coffee is weightened most commonly with sugar, glucose and other materials being more seldom used. Originally the object in adding these materials probably was to preserve the coffee. In the process of roasting the gases generated create pores. In order to close these openings a small amount of sugar was added. If these pores are not closed a fatty oil exudes after a short time, which is affected by the atmospheric oxygen, thus causing a deterioration in the taste of the roasted bean. The temptation, however, soon arose to add more cheap sugar to expensive coffee than was necessary for mere preservation. The public soon accustomed itself to the taste of burnt sugar, housekeepers favored this increased addition, rejoicing over the darker color and better yield of the coffee, without considering that these qualities were to be attributed to a much cheaper substitution paid for at the rate of roasted coffee. As much as 15 p. c. of sugar was added to the crude coffee and at times even more. Besides, the coating of caramel concealed the externally recognizable properties of a poor bean. To the unscrupulous, troublesome sorting became unnecessary and some did not hesitate to sell a cheap Brazilian coffee with this dark coating as fine Java.

Inasmuch as it was difficult to determine how much sugar was necessary for preservation, the sanitary police had difficulty in prosecuting the culprits. A union of wholesale dealers in Germany has adopted the following rule for its guidance.

Every weighting of coffee is to be avoided. Small additions of foreign substance for the sake of preservation are to be permissible, but such additions are not to exceed 1 p. c. of the crude coffee. The outward appearance should not be changed by such addition, so that the purchaser may be enabled to readily recognize a poor or unripe bean.

For the sake of preservation an extract prepared from the fresh pulp of the coffee fruit is recommended. Inasmuch as this is expensive it cannot be used for weighting of the roasted bean. This extract was first examined by Dr. Kayser-Nürnberg, who found traces of caffeine and appreciable quantities of coffeotannic acid. The latter is generally considered to be the mother substance of the aromatic principles of roasted coffee. The results of Kayser have been verified by Stutzer, at least as to caffeotannic acid. The addition of 0.5 Ko. of this extract to 62.5 Ko. of crude coffee in no way interferes with the external characteristics of the bean. That such small quantities of extract really have a preservative influence was determined by a comparison after several weeks' standing.

[Zeitsch. f. angew. Chem., 1895, p. 449.]

Examination of Coffee with Reference to the Yield of Fat, Sugar, and Coffeotannic Acid.

By E. Herfeldt and A. Stutzer.

Fat. Apparently only few observations have been made with regard to the nature of the fat from the coffee beans. According to the older investigations of Rochleder the fat consists primarily of glyceryl palmitate, whereas A. Hilger has recently pointed out that it consists almost entirely of the glycerin oleate with traces of oleic acid.

Proximate analyses were made of three varieties of coffee, viz. Santos, New Granada, and Java.

125 lbs. of green Santos containing 10.18 lbs. fat yielded 102 lbs. roasted coffee containing 16.91 lbs. fat: increase 6.73 lbs. or 66 p. c.

125 lbs. crude New Granada containing 16.37 lbs. fat yielded 102.5 lbs. roasted coffee containing 15.82 lbs. fat: loss 0.55 lbs. or 3 p. c.

125 lbs. crude Java containing 17.50 lbs. fat yielded 102 lbs. roasted coffee containing 11.52 lbs. fat: loss 5.98 lbs. or 33 p. c.

These figures are very striking and the interesting question at once arises, from which constituents does the Santos produce the large amount of fat upon roasting. On the other hand the reduction of fat in the Java, having undergone like treatment, is considerable. Another question of interest is what influence does the fat exert on the quality of the coffee.

Sugar. It is generally accepted that free sugar does not exist in the crude, unroasted coffee. Only J. Bell claims to have found a substance related to cane sugar. The authors test coffee for sugar with Fehling's solution and find none. (However, judging from the methods employed their testimony is of rather questionable character. *E. K.*) The sugar present in roasted coffee is supposed to be a decomposition product of coffeotannic acid, a glucoside.

Coffeotannic Acid. Inasmuch as the intensity of the aroma of roasted coffee is supposed to stand in some relation to the percentage of coffeotannic acid in the green bean, the quantitative estimation of this acid is naturally an interesting problem. Several processes were tried (see original), but no satisfactory results were obtained.

[Zeitsch. f. angew. Chem., 1895, p. 469.]

Pharmacognosy.

Cultivation of Camphor Trees in India.

Plans are being laid to attempt the cultivation of the camphor tree not only on the island of Ceylon but also in the cooler valleys and gorges of the mountainous regions of India. It is shown from historical evidence that this tree was found in former times in Nepal and in the earlier kingdom of Tipra on the upper Irawaddy, and as late as the present century camphor was exported from Chittagong. It is probable that when the natives learned the secret of obtaining and making use of camphor, these trees were completely swept away.

In the government cinchona plantations on the northern slope of the Himalayas in Sikkim and Nimborg, 100,000,000 plants are already flourishing.

[Apotheker Zeitung, 10, (1895), p. 768.]

Guttapercha from Leaves.

So far as known, guttapercha has up to the present time been obtained only by the tapping of those trees which yield the caoutchouc-containing sap. Since after the trunk has been thus bored several times the tree dies, this method threatens with extinction the rubber-producing forests. A Dutch chemist has, however, found that not only the bark of the tree contains the sought-for sap but also the leaves, and in relatively larger quantities than the stem. Consequently in certain plantations only the foliage of the trees is used in obtaining guttapercha. Since the leaves may without injury to the tree be removed twice a year, the natives gather and dry them and send them by the shipload to France where they are extracted with carbon bisulphide, giving a much purer article than by the usual process. If this practice becomes general, a decline in the price of guttapercha may be expected.

[Apotheker Zeitung, 10, (1895), p. 769.]

The Poisonous Action of the Manzanilla Tree.

The caustic and toxic action of the West Indian Euphorbia, *Hippomane manzanilla*, have been long known and have frequently been overdrawn in descriptions. According to Gazeau and Reboul, action at a distance is entirely out of the question or only possible when rainwater from the leaves of the tree fall on the unprotected skin of one standing under it. Pustular eruptions are then formed as is seen to follow the direct contact of the milky juice with the skin. When taken internally, the juice causes symptoms of poisoning in the alimentary canal similar to *Croton Tiglium*. For the treatment of poisoning by the manzanilla, sea water used both externally and internally is recommended. [Repert. Pharm. 51, (1895), p. 465; and Chemiker Zeitung, 19, (1895), p. 340.]

Bacteriology.

The Action of Saprophytic Bacteria on the Toxic Activity of Strychnine.

In order to learn the action of certain saprophytes isolated from human corpses (of wounded individuals), Prof. S. Ottolenghi tried first such dilute solutions of alkaloids in sterilized bouillon, as, when given in definite quantities, were able to call forth the first symptoms of poisoning in animals. The solutions were divided into equal parts, brought into small glass globes (Kugeln), and after inoculating each with one of the various kinds of fresh saprophytes were placed in a thermostat having a temperature of 35°. The loss by evaporation was made up each day by the addition of sterilized bouillon. The toxic strength of the cultures was then tested daily.

In the experiments made with strychnine, *B. liquefaciens putridus*, *B. subtilis*, *B. mesentericus* and *B. coli* were introduced into bouillon. In one culture, a part of the bouillon was replaced by definite amounts of strychnine, in the other not. Both were placed in the incubator and tested daily for toxic activity. He found that in the first days the organisms developed in the strychnine-containing bouillon brought about a strong increase in the toxic activity of the alkaloid. During the succeeding time, it was diminished; on the

34th day it had sunk to the half, and on the 77th was but one-third of its original intensity. Since new tetanic substances are not formed by the poisons eliminated by the bacteria, nor by the dead bodies of the organisms, nor by the disorganized proteid substances of the culture medium, as was shown by the cultures containing no alkaloid, Prof. Ottolenghi believes the increase in the toxic activity of the strychnine during the first few days can be explained in the following way. The toxines formed by the bacteria in the medium when injected fresh into the animals have the effect of weakening them and making them more sensitive to the action of the alkaloid. The increase in toxic activity is, therefore, only apparent. The weakening of the poison, he believes, can be attributed to a consumption or a neutralization of a part of the alkaloid, since the animals used in the experiments showed no pathological symptoms along with the weakening of the tetanic phenomena which could be ascribed to other bacteriological intoxication.

[Centralblatt für Bacteriologie, 18, p. 270; and Apotheker Zeitung, 10, (1895), p. 768.]

Pharmaceutical Societies.

Second International Pharmaceutical Exposition.

The Pharmaceutical Society of Prague has decided to arrange a second international pharmaceutical exposition in August, 1896, at the time of the celebration of its twenty-fifth anniversary. The first exposition of this kind was held in Vienna in 1883.

The Swedish Apothecaries' Society and Bacteriology.

The Swedish Pharmaceutical Society at its Stockholm meeting has voted about $850.00 for the equipment of a bacteriological laboratory in connection with the Pharmaceutical Institute. This institute was founded by the Apothecaries' Society and with its laboratories and collections turned over to the state, which now has charge of and maintains the same. The society also provides the rooms for the new laboratory.

The General Austrian Apothecaries' Society

has received a donation of 40,000 Gulden for the maintainance of its collections and general educational equipment.

Universities and Colleges.

The Chicago College of Pharmacy

has tendered its building and entire equipment to the University of Illinois at Champaign. If accepted the college is to become a department of the university, but is to retain its location in Chicago. It may not be generally known that the University of Illinois has maintained a department of pharmacy at Champaign for several years. The developments will, therefore, be watched with double interest.

In Memoriam.

Dr. Richard Godefroy, Professor of Chemistry at the Technical and Industrial Institute at Vienna, died October 22, 1895. Godefroy was born at Vienna, August 26, 1847. He obtained a good preliminary education at the *Schotten-Gymnasium* at Vienna, was then apprenticed to an apothecary and subsequently studied pharmacy at the university of Vienna. After graduating as Ph. D., Dr. Godefroy accepted a position as assistant to Prof. Redtenbacher, but entered in 1871 upon the position of instructor at the Pharmaceutical Institute of the Austrian Apothecaries' Association in Vienna, which position he filled with much success until 1888. He added to this institute an analytical and research laboratory. During those 18 years many of the present younger generation of Austrian pharmacists have obtained their pharmaceutical instruction and the foundation for their subsequent proficiency under the guidance of the efficient instructor of the Pharmaceutical Institute.

In 1879 Dr. Godefroy accepted the additional position of instructor in technical chemistry at the Industrial Institute at Vienna, which position was raised to a full professorship in 1888, when he resigned the position of pharmaceutical instructor.

Dr. Godefroy has been for many years one of the foremost representatives of Austrian pharmacy. He also acted as juror at the International Exhibitions in Paris, Amsterdam, and Antwerp. He was an honorary member of the Austrian Apothecaries' Association and of the pharmaceutical societies of Brussels, Antwerp, Warschau, and Bukarest.

Prof. Godefroy was an excellent lecturer and skilled analyst. The number of his published analytical reports is large; he also has published several chemical text-books, among them in 1882 a Compend of Pharmacy in two volumes. In the death of Dr. Godefroy Austrian pharmacy has lost one of its foremost scholars, writers, and former professors, whose memory will be dear to the living generation of pharmacists. *Fr. H.*

Literary.

Books and Pamphlets Received.

P. Blakiston, Son & Co.—Philadelphia. Handbook of Pharmacy, embracing the theory and practice of pharmacy and the art of dispensing. By Dr. Virgil Coblentz, Professor of Pharmacy and Pharmaceutical Chemistry in the College of Pharmacy of the City of New York. 2nd Edition, revised and enlarged. One vol., pp. 572, with 437 illustrations. 1895. $3.50.

——The Art of Compounding. A text book for students and a reference book for pharmacists at the prescription counter. By Wilbur L. Scoville, Professor of Applied Pharmacy in the Massachusetts College of Pharmacy. One vol., pp. 264. 1895. $2.50.

——Outlines of Materia Medica and Pharmacology. A text book for students. By H. M. Bracken, M. D., Professor of Materia Medica and Therapeutics, University of Minnesota. One vol., pp. 283. 1895. $2.75.

——Quiz-Compend of Pharmacy. By F. E. Stewart. 5th revised edition. One vol., pp. 187. 1895. 80 cents.

Author—Cincinnati. Etidorhpa; or The End of Earth; the strange history of a mysterious being, and the account of a remarkable journey; as communicated in manuscript to Llewellyn Drury, who promised to print the same, but finally evaded the responsibility, which was assumed by John Uri Lloyd; with many illustrations by J. Augustus Knapp. Author's edition, limited. One vol., pp. 376. 1895.

Ferdinand Enke—Stuttgart. Einführung in das Studium der Bacteriologie und Anleitung zu bacteriologischen Untersuchungen für Nahrungsmittel-chemiker. Von Dr. A. Stavenhagen, Privatdocent für Bacteriologie an der Kgl. technischen Hochschule zu Berlin. Mit 83 in den Text eingedruckten Abbildungen. 1895. M. 4.00.

Wilhelm Engelmann—Leipzig. Anleitung zur Molekulargewichtsbestimmung nach der "Beckmannschen" Gefrier- und Siedepunktsmethode. Von Dr. phil. Gotthold Fuchs, Assistent am Laboratorium für angewandte Chemie der königlich bayrischen Friedrich-Alexanders-Universität zu Erlangen. Mit 18 Textfiguren. 1895. M. 1.20.

C. W. Kreidel—Wiesbaden. Beiträge zur Reinisolirung, quantitativen Trennung und chemischen Charakteristik von Alkaloiden und glycosidartigen Körpern in forensen Fällen, mit besonderer Rücksicht auf den Nachweis derselben in verwesenden Cadavern. Von Dr. Carl Kippenberger, Privatdocenten am eidgenössischen Polytechnikum in Zürich. 1895, pp. 58.

H. Heyfelder—Berlin. Chemisch-technisches Repertorium. Uebersichtlicher Bericht über die neuesten Erfindungen, Fortschritte und Verbesserungen auf dem Gebiete der technischen und industriellen Chemie. Herausgegeben von Dr. Emil Jacobsen. 1895. Erstes Halbjahr. 1te Hälfte. Mit Textabbildungen. 1896.

Chr. H. Tauchnitz—Leipzig. Anatomischer Atlas der Pharmacognosie und Nahrungsmittelkunde. Von Dr. A. Tsirch und Dr. O. Oesterle. Lief. 9, 1895.

Henry Holt & Co.—New York. A Dictionary of Botanical Terms. By A. A. Crozier. One vol., pp. 202. $2.75.

Deutsche Verlags-Anstalt—Stuttgart. Lexicon der gesammten Technik und ihrer Hilfswissenschaften. Von Dr. O. Lueger. Abtheilung 10. Schluss des ersten Bandes. pp. 641—800.

C. W. Kreidel—Wiesbaden. Erläuterungen zur qualitativen Analyse anorganischer Körper. In Bezug auf die practischen Hilfsmitttel und den planmässigen Gang derselben. Von Dr. Alex. Spraul. Ein Bd. 173 S. mit 50 Textabbildungen. 1896. $1.25.

Julius Springer—Berlin. Commentar zum Arzneibuch für das Deutsche Reich. Herausgegeben von H. Hager, B. Fischer und C. Hartwich. Zweite Auflage in 2 Bänden, mit zahlreichen Textabbildungen. Zweiter Bd., erste Hälfte. 384 S. 1895.

Julius Springer—Berlin. Pharmaceutischer Kalender für 1896. Zwei Bde. $1.10.

Bibliographisches Institut—Leipzig. Conversations-Lexicon. Band 10. 1895.

Felix Alcan—Paris. Dictionnaire de Physiologie. Par Charles Richet, Professeur de Physiologie à la Faculté de Médicine de Paris. Tome premier. A—B. Avec gravures dans le texte. 1895. Abasie-Astasie—Aliments. pp. 336.

Author—Madison, Wis. On the Influence of Sudden Changes of Turgor and of Temperature on Growth. By Dr. Rodney H. True. 1885. pp. 38.

Author—On Complex Tartrates and certain Alkaline Solutions of Copper and of Lead. By Dr. Louis Kahlenberg. 1895.

C. Winters Verlag—Heidelberg.—Probleme der Atomistik. Vortrag auf der 67. Jahresversammlung Deutscher Naturforscher und Aerzte. Von Dr. Victor Meyer, Professor der Chemie an der Universität Heidelberg. Ein Heft, 45 S. 1895.

Leopold Voss—Hamburg. Anleitung zur microchemischen Analyse der wichtigsten organischen Verbindungen. Von Dr. H. Behrens. Erstes Heft. 64 S. mit 49 Textabbildungen. 1895. 65 cents.

W. Engelmann—Leipzig. Die natürlichen Pflanzenfamilien nebst ihren Gattungen und wichtigsten Arten. Von A. Engler. Lief. 123—125.

U. S. Department of Agriculture—Washington. Forestry for Farmers. By B. E. Fernow, Chief of Division of Forestry. Pamph., pp. 40. 1895.

Schimmel & Co.—Leipzig. Handelsbericht. October, 1895.

Schimmel & Co.—Leipzig and New York. Semi-annual Report. October, 1895. pp. 78.

L. Bergmann & Co.—Wien. Ueber den therapeutischen Werth des Ferratins. Von Dr. Richard Deutsch, Assistent der I. med. Abtheilung im k. k. Krankenhause Rudolph-Stiftung. 1895. pp. 8.

Wilhelm Braumüller—Wien. Neue Vorschläge zur Prophylaxis und Therapie der Diphtherie. Theoretisch und praktisch begründet von Dr. S. Schwarz, Constantinopel. Sep.-Abdruck aus der Wiener klin. Wochenschrift Nr. 43, 1895. pp. 11.

Lehn & Fink—New York. Antitoxines, vaccine virus, and other Biological Products. From the biological and vaccinal department of the New York Pasteur Institute. 1895. pp. 28.

Armour & Co.—Chicago. Influence of the Thyroid Gland on Nutrition. The Treatment of Goitre, etc., by Dessiccated Thyroids. On Internal Secretions. 1895. pp. 23.

Reviews.

Handbook of Pharmacy, embracing the theory and practice of pharmacy and the art of dispensing. By Dr. Virgil Coblentz, Prof. of Pharmacy and Pharmaceutical Chemistry in the College of Pharmacy of the City of New York. 2nd Edition, revised and enlarged. One vol., pp. 572, with 437 illustrations. Publ. by P. Blakiston, Son & Co. in Philadelphia, 1895. $3.50.

The first edition of this work has been commented upon on p. 295, Vol. 12 of the Rundschau, doing full justice to the general character and value of the elaborate work. The second edition has received a number of corrections and slight alterations and the main omissions pointed out in the previous review have been supplied by the addition of the two new chapters on "Urine and its analysis" and "The application of the microscope in pharmacy," the former one compiled by Dr. G. C. Diekman, the latter by Dr. S. E. Jelliffe. Both these new chapters are on pertinent and most interesting subjects. They are well written, especially the one on urine and its analysis, and they enhance the value and usefulness of the book to the practitioner of pharmacy.

The Handbook is well adapted as a textbook for our students of pharmacy as well as a reference book for the practice of pharmacy; its excellencies far overbalance its few short-comings and omissions. Among the latter may be mentioned the desirable introduction of a chapter on the valuation or estimation of alkaloidal galenical preparations, a subject of constantly increasing importance in manufacturing and dispensing pharmacy. Although still in a state of evolution and imperfection, several methods of considerable value for the identification and estimation of drugs as well as of their fluid extracts and tinctures have been established during recent years. The importance of the application of pharmaceutical research in this direction and of the valuation of the therapeutical constants of important plant remedies is now of such a recognized prominence that it is one of the foremost problems in pharmacy. It is sufficiently advanced to be recognized and incorporated among other unsettled yet progressive subjects in pharmacy.

The book is a credit to its author and publisher and will remain an active factor in the advancement and the application of pharmacy in its duality as an art and a science. *Fr. H.*

The Art of Compounding. A textbook for students and a reference book for pharmacists at the prescription counter. By Wilbur L. Scoville, Professor of Applied Pharmacy in the Massachusetts College of Pharmacy. One vol., pp. 264. P. Blakiston, Son & Co. Philadelphia, 1895. $2.50.

Although the principal textbooks on the practice of pharmacy have given due consideration and space to what still remains the foremost province of the practice of legitimate pharmacy, the art of dispensing, Prof. Scoville has deemed it timely and expedient still more to enlarge upon this domain. He may have done this in order to signalize and to outline once more the true domain of legitimate pharmacy, as against the encroachments and the intrusion of industrial enterprise and the advantages of manufacturing on a large scale, and also to offer to the pharmaceutical practitioner a more elaborate and special reference book both for practice and for authoritative information and protection in questionable cases. In both these relations the author has succeeded well and the book will prove a useful addition to the handbooks of the practice of pharmacy.

The additional name of a text-book for college students seems to us, however, not quite in place. The art of dispensing is so much a handicraft based on practical skill and experience as well as on knowledge, that not the lecture room, but the prescription counter is the proper and almost exclusive place to learn and to master the art of dispensing. And there this handbook will serve as a useful and instructive guide to the learner and as a mentor to the more proficient practitioner.

The few omissions and the elimination of some errors and superfluous ballast will probably be taken into consideration by the author when revising the book for a new edition. It will nevertheless serve its purpose well and retain a deserved place in our pharmaceutical literature. *Fr. H.*

Beiträge zur Reinisolirung, quantitativen Trennung und chemischen Charakteristik von Alkaloiden und glycosidartigen Körpern in forensen Fällen, mit besonderer Rücksicht auf den Nachweis derselben in verwesenden Cadavern. Von Dr. Carl Kippenberger, Privatdocenten am eidgenössischen Polytechnikum in Zürich. C. W. Kreidel's Verlag, Wiesbaden, 1895.

In no department of analytical chemistry is new light more needed and more welcome than in that of forensic chemistry. The isolation of inorganic poisons from the cadaver is a comparatively easy matter when compared with the detection and isolation of organic poisons. Not only are the host of so-called new remedies adding to the complexity of this branch of chemical analysis, but the so-called ptomaines haunt the mind of the forensic chemist with their mock semblance to alkaloids. Furthermore, the forensic chemist has not only to deal with cases of accidental poisoning and intentional suicide, but at times with the victims of ingenious murderers. With the general advance of chemical knowledge matters seem to have become more complicated rather than simplified.

A method of forensic analysis, which will from the very beginning separate the plant alkaloids from those decomposition products of the decaying body producing similar reactions, must therefore be considered a good step in advance over the older methods of Stass-Otto, Dragendorff and others. This great advantage is claimed for glycero-tannic acid as a menstrum for extraction, although the author is aware that alkaloids and ptomaines are not chemical terms in a very strict sense. A number of minor improvements are also discussed: e. g. the conversion of a caustic alkaline solution into an alkali carbonate solution by means of the addition of bicarbonate, thus enabling the substitution of chloroform alcohol or chloroform ether for the objectionable amyl alcohol.

The general tone of the work suggests the skillful and ingenious analyst. Although the new method and minor improvements have been tested in various directions, time alone and extensive application under greatly varied conditions can give that assurance of accuracy which a forensic system of analysis demands.

The brochure is evidently an exact reprint from the Zeitschrift für analytische Chemie, 1895, p. 294.

E. K.

Einführung in das Studium der Bacteriologie und Anleitung zu bacteriologischen Untersuchungen für Nahrungsmittel-chemiker; von Dr. A. Stavenhagen, Privatdocent für Bacteriologie an der kgl. technischen Hochschule zu Berlin. Verlag von Ferdinand Enke in Stuttgart. 1895. M. 4.

Bacteriology has for many years been so closely affiliated with medicine that this relation is usually regarded as the most common one. Most of the text books on the subject have been written by medical men, from a medical standpoint and for a medical constituency. The domain of the science is, however, gradually spreading beyond the limits of pathology and disease, and this new tendency is shown in the appearance of text books in dairy bacteriology and the above lines of activity.

The above brochure of 178 pages is intended to serve as a technical guide to the bacteriological work that is often required of the chemist who is concerned with the examination of food stuffs, etc. From this standpoint, the book fills a new place and fills it well. It is divided into a general and an applied part, the first giving in a compact form the essentials of morphology and physiology together with methods of observation and culture. The applied part takes up the technique of the examination of water, soil, air, and the different food stuffs, including the testing of wines, beers, and mineral waters. As a rule, the general technique of the science is brought down to date, although the antiquated methods of agar preparation and hardening Esmarch gelatin roll cultures in ice water are now superseded by shorter and more convenient methods. A few errors in fact have crept in, such as on page 6 where the optimum temperature of growth for most bacteria is given as between 15—20° C. instead of 25—30° C. The subject-matter is well arranged in a topical manner, copious literature references being given at frequent intervals.

The book on the whole is very acceptable and ought to fill a prominent place in the line of work for which it is intended. Even the general student in bacteriology will find in its pages much that will be helpful to him in his work.

H. L. Russell.

Molekulargewichts-Bestimmung nach der Beckmannschen Gefrier- und Siedepunktsmethode. Von Gotthold Fuchs. Verlag von W. Engelmann, Leipzig, 1895. pp. 40.

This treatise is intended to direct students how to use Beckmann's apparatus in determining molecular weights according to the freezing- and boiling-point methods. In addition to a detailed description of the various forms of Beckmann's freezing- and boiling-point apparatus and the directions for using the same, the author gives briefly the theoretical considerations upon which these methods for determining molecular weights are based. The book contains a table giving the molecular lowering of the freezing-point for twenty-eight different solvents as calculated from the latent heat of fusion according to the formula

$$K = \frac{0.02T^2}{w}.$$

There is also a table containing the molecular elevation of the boiling-point for thirty-four different solvents as calculated from the latent heat of evaporation, according to the formula

$$K = \frac{0.02T^2}{w}$$

and also as deduced according to the formula of Schiff and Trouton, $K = 0.00096T.M.$ Tables and curves showing results actually obtained in determining molecular weights of various substances in different solvents according to the two methods are given, and the anomalies that have presented themselves are discussed. With a few exceptions, the author gives references to literature only in a very general way, not citing number of volume and page.

The book contains little that cannot be found in the literature and in laboratory guides on physico-chemical measurements; at the same time, it will not be unwelcome as it contains in compact form the salient facts that the student needs to know in order to make determinations of molecular weights according to these methods, intelligently and accurately.

Louis Kahlenberg.

Etidorhpa; or The End of Earth; the strange history of a mysterious being, and the account of a remarkable journey; as communicated in manuscript to Llewellyn Drury, who promised to print the same, but finally evaded the responsibility, which was assumed by John Uri Lloyd; with many illustrations by J. Augustus Knapp. [By John Uri Lloyd.] Published by the author, Cincinnati, 1895.

Ever since modern science began its rapid development there have been those who claimed that it would some day furnish the chief inspiration to literature. Most of those who have theorized on the subject have written on science and poetry; but the practical attempts to effect a combination have been mainly in the domain of fiction. The authors of these so-called scientific stories have, however, rarely been either scientists or men of letters. Their object has been to vivify a didactic essay by means of narrative, like Peter Parley; or, like Jules Verne, to overcome prejudice against the novel in general, by representing that their nonsense is really instructive. It is therefore something of a novelty to find a man of established scientific reputation issuing a work of this kind.

The author of Etidorhpa has adopted this literary form to put forward, not definite teachings, but unverified speculations, many of which are on the borderland between physics and metaphysics. At the outset the reader is asked not to "attempt to differentiate between history and romance, fact and fancy, speculation and science, sarcasm, ignorance and irony." It may be doubted whether this request is one that an author has the right to make. But it serves to call attention to the fact that the story is not didactic, but suggestive. This fact is also emphasized by the form of the work. The device of claiming to be only the editor of a manuscript has been frequently adopted. Prof. Lloyd goes one step further, and by posing simply as the executor of an editor reminds the reader still more forcibly that he wishes to escape the consequences of dogmatic criticism.

Viewed simply as a work of fiction, Etidorhpa should be welcomed by those who believe in the ultimate union of science and literature. It is the work of a scientist rather than a man of letters; and from this fact come its greatest faults and its greatest excellencies. Undoubtedly there are some blemishes which a more practiced literary worker would have removed. The pen that describes natural phenomena so vividly and picturesquely gives but a painful jumble of adjectives when it attempts to portray the beauties of Etidorhpa (p. 259); and the impartial reader is likely to wonder if the reference to vivisection may not have been forcibly introduced, and the chapters on drunkenness unduly prolonged, to point a moral at the expense of art.

But the faults, taken at their worst, are trivial, and of the sort that are condemned by formal rules for composition. The excellencies are of a broader kind. Chief among these is the easy movement of the story, which holds the reader's interest in spite of the scientific and philosophical discussions that are so frequently interspersed. The ordinary novelist, when he attempts a narrative that is improbable, aims to secure credence by various literary tricks. These may be successful for a time, but if the reader once begins to consider them, their true nature is as readily seen as is that of the stage settings for a melodrama. Prof. Lloyd's introduction, indeed, shows careful literary ingenuity. This is apparent in the way in which he suggests freemasonry, and the famous Morgan case, while he avoids anything that could definitely prove that he had these in mind. After the story is fairly under way, however, his simple, straight-forward narrative method forms a pleasing contrast to the labored plans of some more famous writers.

In regard to the ideas for the sake of which the work was evidently written, little may be said without disregarding the request of the author, quoted above. Some phenomena that are mentioned are perhaps not so novel as the writer would have us suppose; e. g. the abstraction of water from a solution (p. 140), which has doubtless been noticed by every student who has dipped a piece of filter paper into a solution of a colored salt. But the application, in this case as in others, is doubtless original. The detailed cosmography is of course to be taken as imaginary, and serves mainly to illustrate the speculations as to force.

To any one but a specialist in science, the most interesting suggestions are those of a metaphysical nature. The idea of "eternity without time" (Chap. XLII) is a startling conception, and will fascinate even a mind that at once rejects it.

But although a critic is tempted to discuss the theories set forth in the volume, such a course would be both unprofitable and unfair. As has already been said, the work is suggestive, not didactic. The author will doubtless feel that he has accomplished his purpose if he incites his readers to think more deeply on the questions which science raises, but which lie outside her narrowest materialistic confines. The scope of the work is broad enough to furnish a stimulus to any earnest scientist, no matter what his field. The nature and direction of the thoughts that it arouses will be determined by individual tendencies.

The reader may be somewhat puzzled when he observes that the heroine, if so materialistic a term may be used, is known by the reversed name of a goddess whose most familiar characteristics are sensual. The clue to the proper interpretation is probably found in the crescent moon shown in the illustration, p. 254. This is an attribute, not of the Greek Aphrodite, but of her eastern original, who ruled over the creative forces of nature. Etidorhpa, however, has no single prototype. Of herself she says (p. 257): "I have been known under many titles, and have comforted many peoples. Strike my name from Time's record, and the lovely daughters of Zeus and Dione would disappear; and with them would vanish the grace and beauty of woman; the sweet conception of the Froth Child of the Cyprus Sea would be lost; Venus, the Goddess of Love, would have no place in song, and Love herself, the holiest conception of the poet, man's superlative conception of Heaven's most precious charms, would be buried with the myrtle and the rose."

Although the story is sufficiently fascinating in itself, the pleasure of the reader is increased by the fine typography, presswork and binding of the volume. The illustrations by J. Augustus Knapp also add much. Of these, the photogravure of Etidorhpa is exquisite. The cuts in black and white are very uneven in quality, but many of them are most excellent.

To most of those who have been so fortunate as to secure a copy of Etidorhpa it will probably prove an inspiration. The author has perhaps done well, however, not to give the volume a general circulation. It is conceiveable that to persons who are accustomed to give full credence to Jules Verne, his excellencies might prove a pitfall. Vividness and plausibility of statement is sometimes mistaken for proof; and Prof. Lloyd might find himself at the head of a school of followers of whom he could hardly be proud.

William B. Cairns.

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EDITORIAL.

The Value of Practical Experience.

THE fact that the University of Wisconsin followed the precedent established by Ann Arbor, and in 1894 dropped the practical experience clause from the requirements for graduation, and that since then a number of university schools and independent colleges of pharmacy have done likewise, has given rise to considerable excited discussion and even to demonstrations of ill-feeling on the part of some. This ought not to surprise any one who knows how deep-rooted are the prejudices of the past. It is really surprising that so many have come forward during the last year advocating the abandonment of one of the traditional requirements of American colleges of pharmacy. Whereas the advocates of the new movement have every reason to rejoice over this unexpected success, they can only be discouraged by the misrepresentations on the part of some of those who still cling to the old doctrine.

The advocates of the new movement are again and again accused of depreciating the value of practical experience, whereas, they are really among the staunchest defenders of practical experience. Not one of those who are attacking their so-called non-experience colleagues, or who are advocating the old system on the "educational" basis of dollars and cents has quoted a single sentence in which a follower of the new movement has claimed that graduates without practical experience should be permitted to practice pharmacy. The question is not at all one of experience or no experience, but of the time and position such experience shall occupy in the educational system of the pharmacist. Incidental thereto is the question, shall the college of pharmacy or the state board of pharmacy have jurisdiction over the time spent by apprentices and assistants in drug stores?

Practical experience before or after the college course.

In an article on Apprenticeship, [Pharmaceutische Rundschau, October, 1894.]* the writer traced the historical development of this institution. The historical study of this theme clearly showed that it had its origin in a very primitive stage of civilized society; that with the healthy development of the guilds it grew normally and was at its prime in the 15th century; that with the decay of the guilds it was weakened and that during the past century profession after profession dropped the same. The study of the modern development of the professions clearly demonstrated that the farther a profession had advanced the less was left of this primitive educational system. Instruction by specialists under the more favorable conditions prevailing at colleges and universities, is more and more replacing the instruction by the preceptor or master under conditions that are not favorable to, but often positively detrimental to thorough study.

This, however, by no means implies that the college graduate is a finished product. Those colleges who graduate young men and women without practical experience claim nothing of the kind. They have but an educational function and try to offer to the masters of the profession such young men and women as have a capacity to become masters in turn if they receive the proper guidance at the hands of their experienced elders. These schools ask of the profession not to take the illiterate apprentice but to try young men and women with a fair secondary and college education. Certainly no one will deny that the college graduate will be more benefited by two years of practical experience under proper guidance than the apprentice of twelve, fourteen or at most sixteen. The one comes prepared not only with a well-trained mind, but with a general knowledge of the pharmaceutical sciences, of which the other has not even dreamt. The former acts understandingly, whereas the latter can learn to act merely according to the rule of thumb. A college course never can and never will take the place of every day experience of the drug store. A college degree, as will be shown later, should not imply practical qualification. Unfortunately, in this country, owing to the primitive educational conditions of the first half of this century, it has been made to imply such qualification. Yet no sick person will call on a newly fledged M. D. in a serious case unless compelled by circumstances. No business man will entrust an important legal transaction to a bachelor of law fresh from college; no railroad corporation the construction of a bridge to a recent bachelor of engineering. Congregations, however, are willing to have their souls fed by ardent theologians just from the seminary and druggists expect that a pharmaceutical graduate should know all of the ins and outs of a drug store. Congregations make allowance for freshness of their candidates, but druggists are merciless in their condemnation of graduates who don't know how "to wrap a package," "to sell a piece of soap" or "to make an attractive window display." Yet these are the very criticisms made by those who find fault with the college graduates. If pharmacy is to develop into a learned profession the apprentice must be doomed and the college graduate must take his place while serving his time of probation. A valuable superstructure can be built only on a thorough foundation. Such a system would also put an end to the excessive competition which has so commercialized our calling that but a small professional remnant remains. The high educational standard which will be the best protection of the public, — the *raison d'être* for all pharmaceutical legislation — will also protect the pharmacist and make his business remunerative by preventing Tom, Dick and Harry from entering into reckless competion with him.

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* Copies of this article can be had upon application to the writer.

Shall the colleges of pharmacy or the state boards have jurisdiction over the personell of the drug stores?

At the time that the customary requirements for graduation from colleges of pharmacy were established there was no pharmaceutical legislation by the state, consequently no state board that had jurisdiction over the personell of the drug stores. In this fact lies the reason for the practical experience clause as one of the requirements for graduation by the older colleges. Here also lies the reason for the present misunderstanding.

The first college of pharmacy established in Philadelphia in 1823 was a creation of the druggists of that city, who recognized the need of a systematic training for their apprentices which they themselves could not give. The evening course offered was of the type of the *Fortbildungsanstalten* offered to apprentices of the various trades in Europe. The preceptors themselves constituted the membership of the college and elected largely from their own number competent lecturers for the few important branches to be taught, viz. chemistry, pharmacy, botany and materia medica. It was a course of professional self-education and redounded to the credit of these men. On the other hand, the larger colleges and universities of the East, while offering courses in medicine, law and even theology, looked down upon the somewhat crude attempt of those who were interested in the safety and well-being of mankind and the elevation of their calling — a calling which they loved, though it has never received much support or appreciation from the public at large and little but denunciation from its related profession, medicine. The eastern colleges and universities in making possible the establishment of these schools, committed a sin of omission for which the public has had to suffer ever since. It was a state university of the Northwest which first recognized its responsibility toward the public in this direction.

These older colleges, organizations of the druggists' fraternity, and controlled by them, were not only seats of learning, but were legal and judicial councils as well. Their object was not to educate young men and women in order to enable them to enter upon a calling with a well trained mind, but to take such material as they already found in the drug stores as apprentices and to improve as far as possible their meagre opportunities for learning. The idea was not to improve the system, but to some extent the efficacy of that system, viz. that of apprenticeship. In this they have no doubt succeeded to no small extent. They have done even more: they have materially assisted in demonstrating the inefficiency of the system.

Attention has already been called to the fact that these organizations of practicing druggists, termed colleges, acted also in the capacity of judicial councils. Being self-constituted they were wanting in authority even in their own ranks. This was soon felt and in the older states these colleges soon became the strongest supporters of state legislation. The state laws which resulted, soon assisted in impressing on the colleges the true stamp of merely educational institutions. For a time the diplomas of the colleges were accepted as prima facia evidence of practical qualification. This led to the establishment of numerous colleges which were largely frequented by young men as the best and easiest way to avoid the state board examination. The result can be anticipated. The multiplication of colleges did not improve pharmaceutical education and state boards began to discriminate and ultimately to refuse all diplomas. In this respect the evil course of competition brought about a good result. The colleges became more and more educational institutions and the state board took control of judicial matters.

In many of the northwestern and western states pharmacy laws and state boards were established before the schools of pharmacy. Yet even here the proper function of the school was not always recognized immediately. Those who had secured pharmaceutical legislation and the establishment of chairs of pharmacy in connection with state universities or private institutions were saturated with the traditions of eastern states. It was in connection with these state universities of which the established courses of pharmacy were an integral part, that the inconsistency of their dual position was first recognized. Universities as well as colleges are educational institutions and that only. They may become advisory bodies but never should assume functions of state boards. The functions of advocate and judge might as well be incorporated in one person. It was a wise act on the part of legislatures to provide for an education in pharmacy as well as in agriculture or engineering, in philosophy or Greek. However, these same legislative bodies enacted laws which placed the authority to control the conditions of pharmacy of the state in the hands of a state board. State board and state university or college should work hand in hand for the physical welfare of the community and the improvement of that branch of the healing art which they represent; but the duties of the one should never be confounded with the authority and duty of the other. When the exact relations of the two are more perfectly understood we may no doubt expect better results.

The law enacted by the last legislature of Wisconsin placed a clear and definite interpretation upon the relation of the state university and the state board. Recognizing the value of a university course, it gives the university graduate the advantage of the time and money spent in preparing himself for a calling that is of sufficient importance to demand state control. The university is to teach him the pharmaceutical sciences, but it is not to decide whether its own graduate is fit to practice pharmacy or not. The university graduate must have had two years of experience with practicing pharmacists before he can present himself to the state board for examination. In other words, having received his scientific training, the university graduate must serve two years of probation with those who are supposed to be qualified, and then the state board of examiners will determine whether he is fit or not to practice pharmacy independently.

This relation foreshadows a more ideal condition to be hoped for in the future. The universities are far from underrating the experience well trained young men and women can receive in well equipped pharmacies. The state board, not the university, however, has by law control over the time spent in such pharmacies. There is but one logical consequence. The state board, not the university or college, must determine whether such time has been well spent, and whether the young man or woman with the scientific training of university or college has sufficiently profited by such time of probation to be trusted to practice pharmacy independently thereafter. *E. K.*

Announcement.

If one may judge from the expressions of opinion received, the change from the German to the English language has met with general approval, not only on the part of those who could not read the Rundschau before, but also on the part of the German contingent of its readers in this country. Numerous expressions of good will have been received from its old friends among the readers, also from editors of the better class of American pharmaceutical journals. The Pharmaceutical Review is highly appreciative of and grateful for such expressions of collegiate good will. Nothing will be left untried to make the Review deserving of all praise that has been bestowed upon it.

The opinion expressed by some that the Pharmaceutical Review was to be a new journal, no doubt has been dispelled by the January number. Although, with the completion of the thirteenth volume, Dr. Hoffmann has retired from the formal management of the journal established by him, he will still maintain an active interest and participation in its affairs.

With the opening of the new year Dr. Hoffmann sailed for Europe to enjoy a much needed rest. On the evening of December 27th a few personal friends met in the rooms of the German Club of New York to bid him farewell. The farewell, however, was coupled with the hope and the expressed belief of all present that before long we should have the pleasure of again seeing him on this side of the Atlantic. While abroad, Dr. Hoffmann will contribute to the Review the results of his observations on several events of great pharmaceutical interest. At the Industrial Exposition at Berlin, chemistry and pharmacy will certainly be well represented. The International Pharmaceutical Exposition at Prague, to which Dr. Hoffmann has been appointed juror, will also afford an abundance of material for correspondence. Several European pharmaceutical societies will celebrate their 25th and 50th anniversaries respectively. American pharmacists may therefore congratulate themselves that a careful observer and an excellent writer will be on the field to inform the readers of the Pharmaceutical Review.

E. K.

ORIGINAL CONTRIBUTIONS.

Kava-Kava.

By *Dr. Rodney H. True.*

It seems to be a well established fact that mankind has an inborn craving for something of an intoxicating nature, and, as if to furnish the means for the satisfaction of this craving, Nature has supplied almost all parts of the inhabited world with some plant or plants which either directly or after proper preparation supply the sought-for article. Among the plants possessing intoxicating principles is one which of late has attracted considerable attention among physicians and pharmacists, namely, *Piper methysticum*, commonly known as kava-kava.

This is a near relative of the plant producing the commercial black pepper, *Piper nigrum*, also of that yielding cubebs, *Piper cubeba*, and like them is from the warmer climates of the East. *Piper methysticum* is a shrub usually about six feet in height, with a growth resembling somewhat that of the bamboo. The stems, having a diameter of one to one and one-half inches, are jointed, the nodes being separated by a distance of three or four inches. The thin leaves are heart-shaped, three to four inches in length, and of nearly equal width. The root system is large and spreading, weighing when fresh from two to four pounds, usually, but occasionally as much as twenty. In drying, it loses about one-half its weight, having in this dry condition, a light, fibrous structure. The root is covered externally by a thin, grayish-brown bark and, when fresh, the interior is of a yellowish color. It is this large root system and the bases of the stems that furnish the kava-kava used by the natives and by physicians.

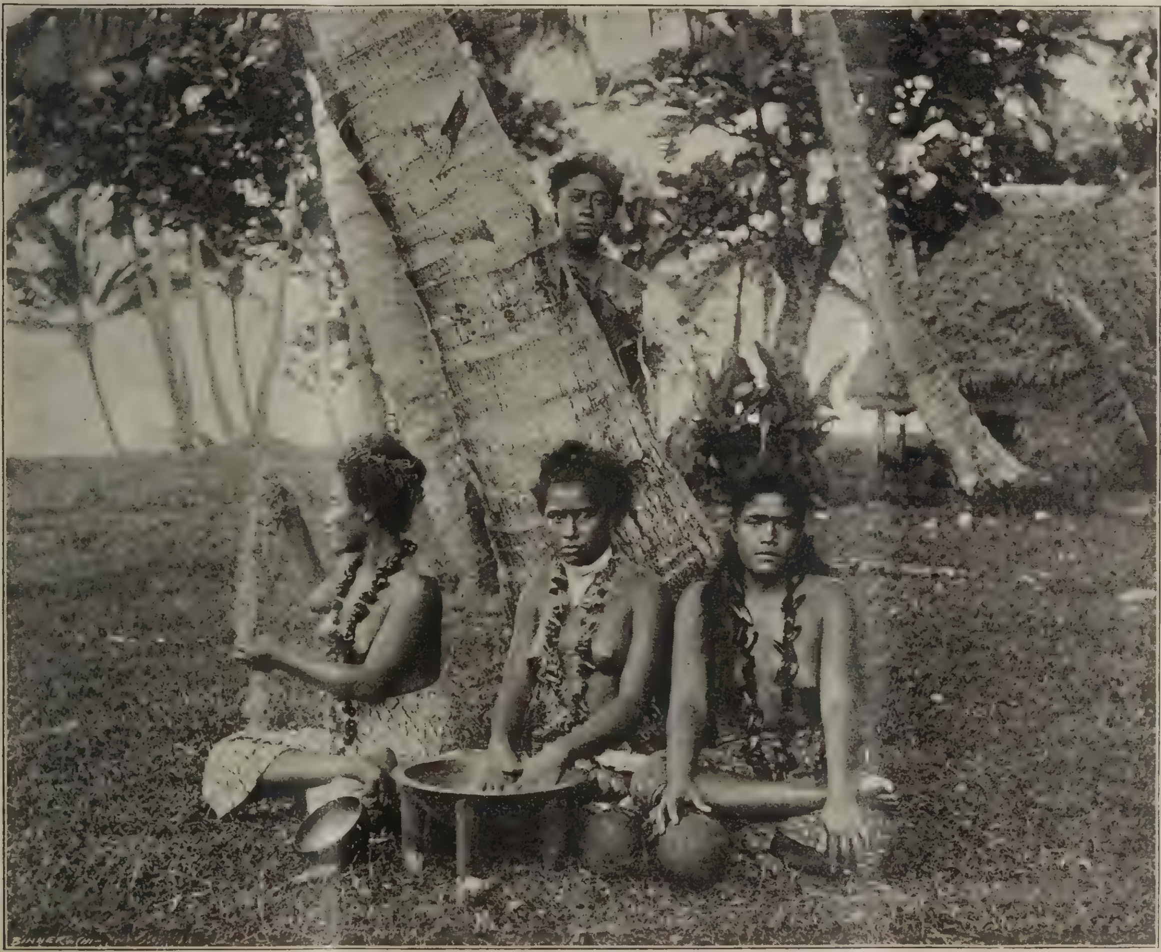
This plant seems to have a wide geographical distribution, appearing to grow on almost all of the tropical and sub-tropical islands of the Pacific ocean. It seems too to be known under a variety of names. In Tahiti, it is known as the "ava-ava"; in the Sandwich Islands as "kawa-kawa"; in the Marguesas Islands as "kava-kava", while the Fijians call it "yakona." The various names, however, are not confined strictly to the islands named.

This plant in common with the other members of the pepper family has a very characteristic structure. The transverse section of the root shows a thin bark underlaid by a very thin cortical region. The central pith, occasionally somewhat eccentrically placed, is in the larger roots quite ample and in the dry drug is usually cracked leaving a central cavity of greater or less size. In the smaller roots, the pith is frequently very much reduced and hardly at all represented. The woody bundles appear as lines extending from the circumference of the pith, in the older roots, to the bark. The lighter colored alternating areas, usually a number of times as wide as the woody portions, are the medullary rays. Occasionally a woody bundle is seen to fork. The pith is soft and mealy as are also the tissues forming the medullary rays, the cells of both being closely packed with starch grains. In these two regions as well as in the thin cortical layer just beneath the bark, are cells containing the resinous active principles of the plant, the woody, fibrous part being practically wanting in resin-containing reservoirs. In large roots a sort of network is formed by woody masses that extend from one wood region to another, perhaps to hold the widely separated woody regions together and to prevent them from splitting apart along the ample medullary rays.

Although coming to our notice as a drug at a comparatively recent date, kava-kava has been long known. The first published account of the plant and more especially of the uses to which it is put by the natives of the Polynesian Islands, seems to have been given by Captain James Cook, the famous English explorer. He found the plant first, it seems from the journal of his first voyage around the world, in the Tahiti Islands in 1769. Since the manner of use is more fully described by a later writer, we will neglect Captain Cook's account beyond the mere observation that he believed the plant to be widely distributed among the islands of the Pacific ocean. In the account of his Three Famous Voyages Round the World the reader may find frequent mention of the plant in question.

M. Lesson published about 1822, a notice on this plant in which he says "the natives of Carolina" (probably the Caroline Islands) "prepare a drink from it which they call sheaka".

In 1844, T. R. N. Morson published an article in the Am. Journal of Pharmacy, p. 105, in which he described the process by which the natives of the Tonga Islands prepare an intoxicating drink known by the name of kava-kava. The preparation is attended by a rather elaborate ceremony which is described in Mariner's History of the Tonga Islands. Since this ceremony is of considerable interest, a description condensed from Mariner's account is here given place. Although it is indulged in privately, the brewing of the drink seems to be a characteristic feature of public occasions, when it is prepared before a considerable company.



Preparation of Kava-Kava. *

The root, after being scraped clean with mussel shells, is chopped up into small pieces which are passed around to those in attendance to be chewed. Among the company, which up to this time has been silent, is now set up a social hum and the chewing of the root begins. No one volunteers for this work, however, but young persons who have good teeth, clean mouths, and who are not suffering from colds. Women frequently take their share in this work. After a few minutes of diligent mastication, the root is sufficiently ground up and the moist pulp in the form of a ball is laid on a piece of banana or plantain leaf. After enough root has been chewed, silence again ensues. A wooden bowl sometimes three feet in diameter and a foot deep in the center is placed on the ground before him who is to make the infusion. The chewed masses are now brought to him and carefully placed in the bowl, first on the bottom and then up the sides, thus exhibiting the quantity of root available for the infusion and enabling a judgment to be made concerning the quantity of the beverage. All now seat themselves and the man who has charge of the bowl presents it to the chief. If the latter thinks more is needed, more root is brought and the chewing process is resumed until the required amount of the pulp is obtained. The two assistants who are to obey the master of the brew now take their places on opposite sides of the bowl, one to fan away the flies with a large leaf, the other to pour water from cocoanut shells over the pulp. Before this is done, the man in charge washes his hands and kneads the balls of chewed root into an homogeneous mass. Water in sufficient quantity is now poured over it, mixed with the mass and the dregs pressed firmly together at the bottom of the bowl. The "fow" is now produced, a mass of fibrous material obtained by tearing the bark of a native tree into narrow strips. To hold the strips together, they are at one end braided into a narrow margin. This strainer, for such is the office of this article, is now thrown on to the surface of the liquid, the edges on opposite sides of the bowl are carried down along the sides of the bowl to the bottom where they meet, thus enclosing the mass of pulp. The "fow" and the entangled dregs are now raised from the dish and the infusion carefully wrung out. This process is two or three times repeated until only very fine particles remain. The beverage has now the color of coffee with plenty of milk added, and it is ready for use. Cups artistically constructed from pieces of banana leaves are now made and filled. The filling is done by wringing the saturated mass of fibre over the cup. The name of the person to whom the draught goes is now announced. He replies by clapping his hands to show where he sits and the cup-bearer brings it to him. If he be a chief, the cup is presented by the attendant sitting, if not, while standing.

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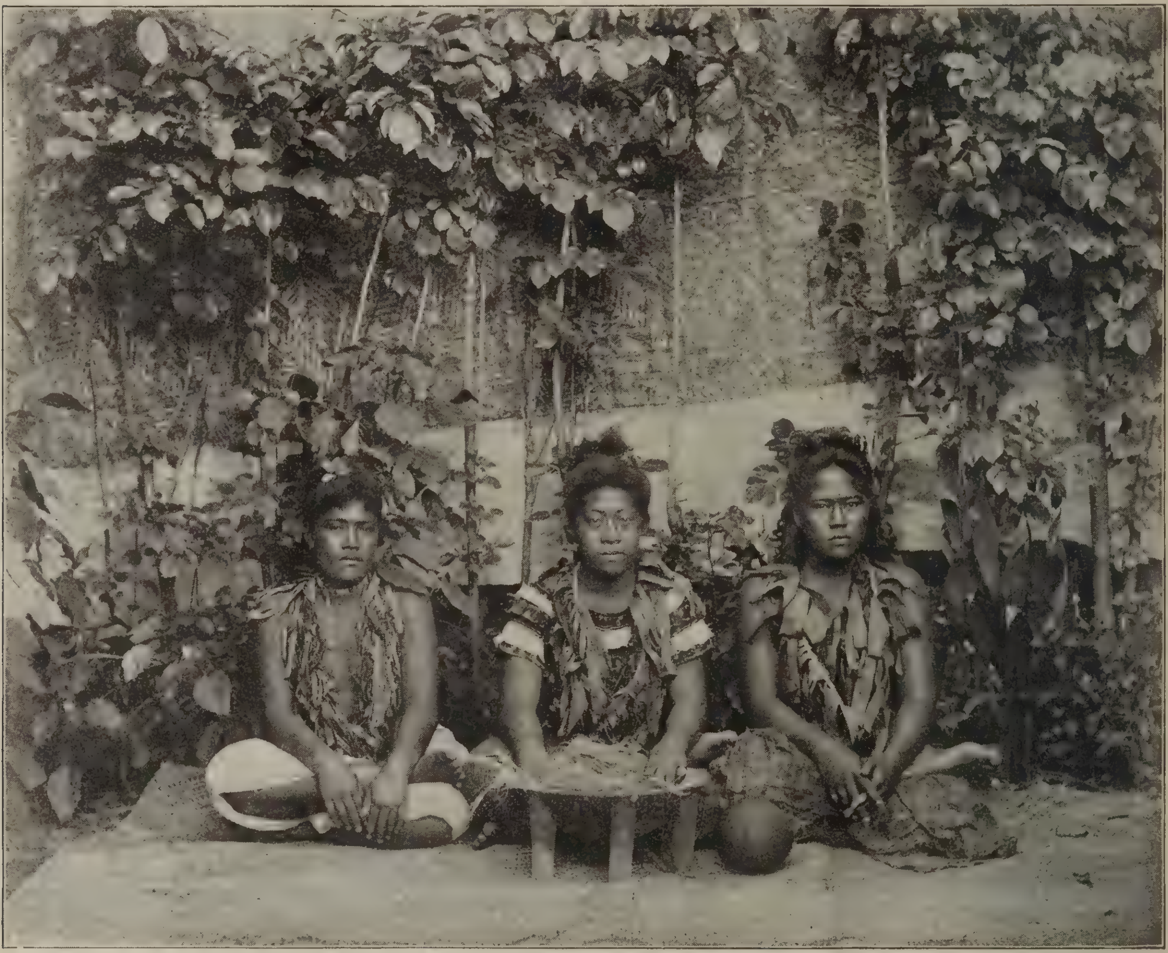
* Utensils used in preparation of Kava-Kava. Bowl in middle, cocoanut shell near by; "fow" held up by person at left side of picture.



Preparation of Kava-Kava. *

If drunk in moderate quantity consciousness and reason are in no way impaired, becoming on the contrary even sharpened. After more has been taken a condition of happy carelessness follows, the individual shows a dreamy consciousness, and if still more be imbibed, the limbs become languid, gradually the will loses power over the muscles, co-ordinated movements cannot be easily executed, the individual lies down and sinks gradually into a sleep. This state, according to Lewin, may last for from two to six hours, the awakening being accompanied only by a languid feeling in the limbs. In a recent account of the Fijians in the Pop. Science Monthly, Dec. 1895, Weld says that a partial paralysis of the lower limbs may occur before consciousness is at all affected. Certain it is that the intoxication caused by kava-kava is of a mild, quiet type which does not render the individual ugly and quarrelsome, a point of superiority claimed by the natives for their drink over the alcoholic beverages of the Europeans.

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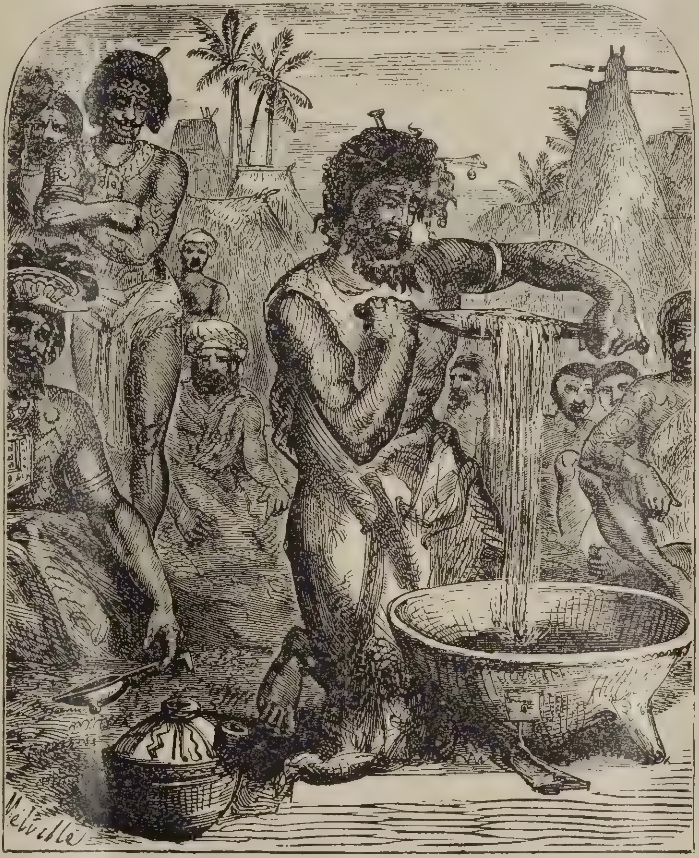
* "Fow" shown in use, thrown on surface of infusion in bowl.

These pictures are from photographs taken in the Samoan Islands, and now in the pharmacognostical collection of the School of Pharmacy of the University of Wisconsin.



Preparation of Kava-Kava. *

Used in moderation, kava-kava is probably not followed by injurious effects, according to Seemann's Mission to Viti, but when taken in excess it gives rise to skin diseases, owing to its over-excitement of the sweat glands. Dr. Gulick says that the natives of the Sandwich Islands use it as a cure for cutaneous diseases, the effect of a continued treatment with kava-kava being the cracking and falling off of the cuticle over the whole body. In parting with this, the system is believed to be freed from its maladies. Kava-kava is also effective in preventing corpulency, a condition very unpopular in these islands. In addition to the strong sudorific action, it is held that this beverage is responsible for a diseased condition of the eyes seen in habitués of the kava.

The physiological action of the drug is consistent with the effects of the beverage on the drinkers as mentioned above. The results of the investigation of several experimentors is summed up by Dr. Cerna in the Therapeutic Gazette, 1891, p. 7, substantially as follows: Taken internally or through hypodermic injections, the drug produces an increased flow of saliva, a burning sensation in the mouth, followed by a marked numbness, a general depression of nearly all the normal functions, and lastly paralysis, this being most noticeable in the hind extremities, especially in the case of the frog. Simply placed on the tongue, the drug produces a momentary burning sensation with increased secretion of saliva, which is soon followed by a local numbness, lasting for a considerable time. When the fluid extract is applied directly to the cornea and conjunctiva, sensibility is lost in a very short time and the eye can be irritated and even scratched without signs of pain being shown by the animal. The great muscular weakness observed in higher animals, under the action of the drug, is of spinal origin since the higher nerve centers retain their normal functional activity. This is seen in the native who with a clear head finds himself unable to "walk straight" after too freely imbibing of kava-kava. Small as well as larger doses depress the circulatory system and finally in sufficiently poisonous amount, kava-kava produces death through failure of the respiration or through cardiac paralysis, especially the former.

Although complete unanimity on the subject does not prevail among investigators, it seems probable from Dr. Lewin's researches, that the active principle producing the anæsthetic effect is the resinous substance present. Since resin itself is not soluble in water, an apparent contradiction arises. If insoluble in water, how can the beverage of the natives, simply a cold infusion of the ground root, produce its characteristic action? During the progress of an investigation of the kava-kava in the chemical laboratory of the School of Pharmacy of the University of Wisconsin, the presence of potassium chloride in the alcoholic extract containing the resin was detected. Investigation has rendered it probable that this salt stands in a peculiar relation to the resin molecule, being apparently in chemical combination with it. It seems likely that this peculiar condition may explain the somewhat paradoxical situation before us. The formation of an emulsion with water seems to be indicated. This question is receiving further investigation.

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* Infusion being wrung from "fow".

From cut in Captain Cooks Three Famous Voyages around the World. London. Ward, Lock & Co.

Pharmacognostical Lab.,
University of Wisconsin.

◆

Oil from Pycnanthemum Lanceolatum Pursh.

By *W. G. Correll.*

In the early part of the month of August, 1894, mountain mint in full bloom was collected in low meadows south of Madison, Wis. The plant was identified by Mr. L. S. Cheney, instructor in pharmaceutical botany in the university. The flowering herb was air-dried and the dried product distilled as soon as convenient with water vapor. The oil obtained was of a yellow color of medium depth; its odor resembling that of pennyroyal. The specific gravity at 20° was found to be 0.9135, and 0.9170 at 15°. In a 100 mm. tube the oil at 20° turned the plane of polarized light 2.95° to the right, hence $[\alpha]_D = + 3.25°$.

In 1877 Dr. Charles Mohr made an examination of *Pycnanthemum linifolium* Pursh., a household remedy used extensively by southern negroes, but states very little of the volatile oil. (Proceedings of the A. Ph. A., Vol. 34, p. 513.) Dr. Mohr calls attention to the close botanical relationship of *Pycnanthemum linifolium* and *Pycnanthemum lanceolatum*, both of which were described as one species by our earlier botanists, as *Thymus virginicus* L.

Somewhat more than a year ago H. C. Barker made an examination of *Pycnanthemum lanceolatum* (Am. Journ. Pharm., Vol. 66, p. 65). The specific gravity of his oil was 0.9361 at 15° C. The U. S. Pharmacopoeia gives the specific gravity of oil of pennyroyal as 0.93 to 0.94 at 15°. The similarity of the odor of oil of *Pycnanthemum* with that of pennyroyal, the almost like specific gravity of the two, the similar behavior on heating, would strongly indicate a resemblance of the two oils. In order to ascertain the correctness of the suspicion a small quantity of the oil was distilled last summer and has recently been tested for pulegone, as well as phenols.

Isolation and Identification of Carvacrol.

In his report on *Pycnanthemum linifolium* (loc. cit.) Dr. Mohr called attention to the fact that both the *P. linifolium* and *P. lanceolatum* have been described by earlier botanists as *Thymus virginicus* L. This led the writer to make a preliminary test for the phenols, thymol and carvacrol. The test with ferric chloride failed, but that with caustic potash and chloroform gave the characteristic reaction of thymol and its isomer carvacrol.

Carvacrol was isolated from the oil of mountain mint by shaking the oil with an equal volume of a 10% aqueous solution of caustic soda. From the caustic soda solution, after separation from the oil, the carvacrol was precipitated by adding dilute hydrochloric acid in excess. The eliberated carvacrol was purified by distillation with water vapor. About 6.2 grams or 7.2% of bright yellow carvacrol were thus obtained.

Carvacrol sulphonic acid was prepared by adding 5 ccm. of concentrated sulphuric acid to 3 grams of carvacrol and stirring until the mixture began to solidify when it was set aside over night. A small quantity of water was added, which formed a reddish liquid with the crystalline magma. Upon standing, crystals again formed which were separated. After drying, the lighter colored crystals were picked out. They melted at 56°—57°. Carvacrol sulphonic acid is stated to melt at 58°, thymol sulphonic acid at 98°.

Dicarvacrol was prepared by adding solution of ferric chloride to the aqueous distillate from which the carvacrol had been separated. The dicarvacrol crystallized on standing, and when dried melted at 145°—147°. Dicarvacrol is stated to melt at 148°, dithymol at 165°.

According to A. v. Baeyer (Berichte, Bd. 28, p. 653), a very dilute alkaline solution of thymol, also one of commercial carvacrol were prepared. To each were added a small quantity of sodium nitrite solution, then dilute hydrochloric acid, and the solution let stand. Over night, yellowish-brown needles separated which were dissolved in aqueous ammonia and precipitated with dilute acetic acid. The thymol derivative produced a solid amorphous precipitate, the carvacrol derivative oily drops which crystallized shortly.

The carvacrol from the oil of mountain mint, when treated according to this process, gave the same reactions as the commercial carvacrol.

Tests for Pulegone.

The oil after the removal of the phenols was tested for pulegone. (1) According to Beckmann by attempting to prepare pulegoneoxime. (2) According to v. Baeyer (Berichte, Bd. 28, p. 653), by trying to obtain nitrosopulegone.

Both tests, although tried repeatedly, gave negative results inasmuch as no crystals could be obtained. Duplicate experiments were made successfully with oil of pennyroyal.

Fractionation of the Oil.

Four fractions of the oil were obtained, each containing about the same amount, leaving in the fractionating flask a small quantity of residue of a reddish-brown color and of a syrupy consistency. The fractions were placed in a freezing mixture twenty-four hours, but nothing separated.

First fraction	180°—200°
Second "	200°—210°
Third "	210°—220°
Fourth "	220°—230°.

The last fraction on standing developed a slight peppermint-like odor, and was of a light yellow color. At 20° it had a specific gravity of 0.9224. In a 100 mm. tube the fraction turned the plane of polarized light 13.73° to the right, hence $[\alpha]_D = +14.88$. The great difference between the rotatory power of the fourth fraction and that of the original oil clearly indicates the presence of other optically inactive substances in the lower boiling fractions. Upon combustion the fourth fraction yielded the following results:

I. 0.231 g. yielded 0.6668 g. CO_2 = 0.18185 g. C,
and 0.231 g. H_2O = 0.02575 g. H.
II. 0.1858 g. yielded 0.534 g. CO_2 = 0.14547 g. C,
and 0.1854 g. H_2O = 0.0209 g. H.

Calculated for	Found	
$C_{10}H_{16}O$	I.	II.
C . 78.94 p. c.	78.72 p. c.	78.83 p. c.
H . 10.52 p. c.	11.14 p. c.	11.24 p. c.

This corresponds with the formula of pulegone, but the fraction failed to give the nitrosopulegone reaction. Unfortunately one half of the small quantity of oil was accidentally lost, so that further attempts to identify this fraction had to be given up for the present.

In the early part of the month of June, 1895, a second quantity of mountain mint was collected before it had blossomed, and distilled with water vapor. A small quantity of the oil was obtained which at 20° had a specific gravity of 0.9160, the specific gravity of the first oil being 0.9135 at 20°. In a 100 mm. tube the oil turned the plane of polarized light 0.810° to the right, hence $[\alpha]_D = +0.88°$; the $[\alpha]_D$ of the first oil being $= +3.25°$.

On fractionation under diminished pressure three fractions of the oil were obtained.

First fraction	90°—110°	under 34 mm. pressure.
Second "	110°—135°	" 33 " "
Third "	135°—138°	" 36 " "

Each fraction, heated with caustic potash and chloroform, gave the characteristic reaction for carvacrol. When the fractions were treated with an equal volume of a 10% aqueous solution of caustic soda it was found that they contained about 9% of carvacrol. The quantity of oil was too small to allow of further examination. During the past summer some more oil was obtained. This will be examined as soon as an opportunity presents itself.

◆

A Convenient Test for Thymol and Carvacrol in Volatile Oils.

The presence of carvacrol in oil of *Pycnanthemum lanceolatum* was indicated by the beautiful purple-red color produced on heating 0.01 gram of the oil with 0.01 gram of caustic potash and 20 drops of chloroform (Flückiger, Pharmacognosie, 3rd Ed., p. 156). A small quantity of commercial thymol and carvacrol were each treated in the same way. The carvacrol gave a beautiful purple-red, the thymol a similar color. In order to test the general application of this reaction, oil of monarda and oil of thyme, which are known to contain these phenols, were tested in this manner and gave the characteristic reaction.

The following labiate and coniferous oils, which are not supposed to contain these phenols, when tested, did not give the reaction for thymol or carvacrol: Three samples of pennyroyal oil, two of spearmint oil, one each of the oils of spike, lavender, rosemary, balm, and peppermint; also two of turpentine oil, one each of the oils of juniper berries, savin, cedar, balsam fir and white spruce.

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◆

New Chemical Balances.

By *Dr. Louis Kahlenberg.*

Some months ago two new chemical balances were sent to the Department of Pharmacy of the University of Wisconsin by Paul Bunge of Hamburg, manufacturer of precision balances. These balances have since been in use in the laboratory.

The better one of these balances is shown in Fig. 1. Its case is of mahogany and the bottom plate of heavy, finely glazed white porcelain. The pillar and beam are of brass, while the wire of the hangers and the pointer are nickel-plated. The pans are of rock crystal. Considerable ingenuity has been shown in the construction of the balance beam to secure lightness combined with rigidity. The shape of the beam and also the arrangements for adjusting the position of the center of gravity and for balancing are shown in the cut. The balance is provided with a plumb-line to show when it is level. The knife-edges and planes are of agate. By means of small set screws that hold the former in place, their position can readily be adjusted. Instead of lowering the beam so that the middle knife-edge rests on the central plane, as is the case in most chemical balances, the central plane is raised up against the middle knife-edge, thus lifting the beam from the steel edges (see cut) upon which it rests when the balance is not in use. To admit of this the central agate plane is fixed upon a steel rod that slides inside of the main brass pillar. This rod is moved by means of an eccentric fixed on a horizontal rod underneath the balance. The latter rod, upon which are also two other eccentrics that move the pan-supports at the same time that the beam is lifted, is turned by means of a small crank at the left. These pan-supports are brass rods tipped with agate; they slide in brass sockets. The small pins on the upper part of the hangers, as well as the sockets into which they fit when the balance is at rest, are also of agate.

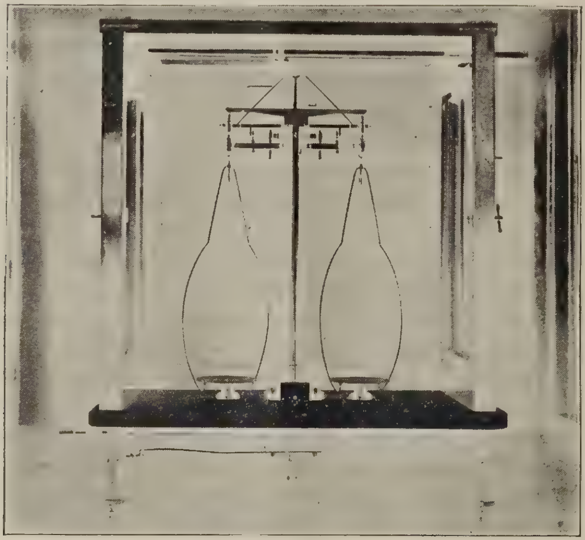

Fig. 1.

The scale on the beam is divided into ten equal parts, the zero being at the extreme left. Each division is again divided into tenths. The rider weighs five milligrams and the arrangement for moving it is particularly convenient. The balance will bear a load of two hundred grams. It turns readily with an overweight of one-tenth of a milligram, and tests have shown that its sensibility is very nearly independent of the load on the pans. The workmanship throughout is substantial and well executed. The balance is characterized by simplicity in the construction of its parts. Thus far it has given entire satisfaction.

The other balance is shown in Fig. 2. It is constructed on the same general plan as the one just described. With a few exceptions its parts are made of the same material as those of the balance in Fig. 1. The agate parts are the knife-edges and planes. The bottom plate is of black porcelain. The pans are nickel-plated, and the hangers are somewhat different in shape, as shown in the cut. The beam is heavier and of different shape and construction (see cut). The divisions on the beam are the same as on the balance in Fig. 1. A rider weighing fifty milligrams is used.

The balance will bear a load of two hundred grams. It is intended to weigh accurately to one milligram. It turns very readily for an overweight of one milligram, and its sensibility has been found to vary but very little with the load on the pans. The balance is intended for the less accurate work of the laboratory. It is well enough made, however, to allow one to estimate the tenths of a milligram from the oscillations. This balance too is simple in construction; its parts are well made and promise to be durable. The balance has thus far given satisfaction in actual use.

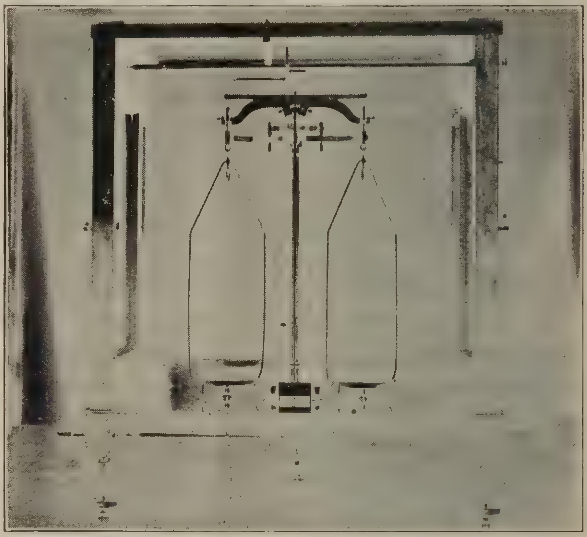

Fig. 2.

The photographs for the two cuts were kindly prepared by Prof. J. G. D. Mack of the Engineering Department of the University of Wisconsin.

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Oil from Tsuga Canadensis *Carriere.*

(*Hemlock Oil.*)

By *Carl G. Hunkel.*

In an interesting contribution, entitled *Beitrag zur Kentniss der Fichtennadeloele*,* Bertram and Walbaum report on the composition of an oil, called by them *Canadisches Tannenoel* (Spruce oil), and supposed to be derived from *Abies canadensis* L. With regard to its source they make the following additional statement: "Das *Spruce oil* wird aus den Nadeln und jungen Zweigen der in Nordamerika einheimischen Hemlocktanne dargestellt."

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* Archiv. f. Pharm. 231, p. 294.

That there is a mistake somewhere is quite evident. Dr. F. B. Power, in his excellent Descriptive Catalogue of Essential Oils and Organic Chemical Preparations, makes the following statement under the heading of the true Oil of Spruce* (p. 74.) "This oil of spruce is apparently the product which was examined in the laboratory of Messrs. Schimmel & Co., Leipzig, and designated as *Hemlocktannen Oel* with reference to its supposed botanical source from *Abies canadensis* Michx., which is popularly known in America as Hemlock Spruce. The latter, however, is believed to be the source of commercial oil of hemlock, which is probably similar in composition to the true oil of spruce."

True Spruce oil from *Picea nigra* Link of undoubted source was examined by the writer last year.† It was found to contain 48.85 p. c. of laevogyrate bornyl acetate, which up to that time was probably the largest percentage of this ester found in a volatile oil.‡

In the latter part of September 1894, the writer collected the leaves and twigs of the true hemlock, *Tsuga Canadensis* Carriere, better known in pharmaceutical literature as *Abies Canadensis* Michaux, at the dells of the Wisconsin river. The material was identified by Mr. L. S. Cheney, instructor in pharmaceutical botany at the University. This material was distilled with water vapor immediately upon arrival at the laboratory, but the yield was comparatively small. The oil possessed a yellowish color and the characteristic odor of hemlock. The sp. gr. of the dried oil was 0.9288 at 20°; its $[\alpha]_D = -18.399°$ at the same temperature.

Distilled under a pressure of 30 mm. the oil yielded a fraction, which boiled between 121–125°. This appeared to be almost pure bornyl acetate, though it contained sufficient of the offensive odoriferous principle of the hemlock oil to distinguish it from synthetic bornyl acetate in odor. The sp. gr. of the fraction was 0.9819 at 20°, $[\alpha]_D = -17.228°$.

A small quantity of oil was saponified with an excess of alcoholic potassa of known strength; the excess of potassa was titrated back with $\frac{N}{1}$ sulphuric acid. The ester was calculated as bornyl acetate. In one instance 52 p. c. in another 51.5 p. c. of acetate were obtained. The yield of acetate, therefore, is even somewhat greater than that of the oil of black spruce. The slight difference in percentage, however, may be accounted for by the difference of almost two months in the time of collection; the material from the black spruce being collected early in August, that from the hemlock late in September. The observation has been made that the cones of the balsam fir, which were fairly rich in volatile oil in early August, yielded no appreciable amount of oil when collected and distilled late in September. A partial modification of the pinene of the oil of hemlock rendering the same non-volatile could easily be made to account for the somewhat higher percentage of bornyl acetate.

A large portion of oil, including the non-bornyl-acetate fraction of the quantity distilled under diminished pressure, was saponified with caustic potassa and distilled with water vapor after saponification. Oil distilled over at first but later borneol separated in the condenser. The borneol that could be collected mechanically was dried and recrystalized from petroleum ether. The hexagonal plates resulting melted at 203¼° C. They were laevogyrate, $[\alpha]_D$ being $-8.6°$.

The oily distillate was separated, dried and fractionated, the following fractions being obtained:

a. −155°
b. 155°—160°
c. 160°—165°
d. 165°—170°
e. 170°—175°
f. 175°—185°
g. 185°—195°
h. 195°—215°
i. 215°+

Fractions e, f and g contained large amounts of borneol and the residue in the flask (i) was almost pure borneol. Fraction 155°–160° (b) was the largest. Its sp. gr. was 0.8658 at 20°; $[\alpha]_D = -21.18°$. Fraction 160°–165° had a sp. gr. of 0.8689 at 20°; $[\alpha]_D = -23.178°$. The borneol was removed from the higher fractions by submitting them to the temperature of a freezing mixture. The oil thus deprived very largely of its borneol was several times fractionated. In this manner a fraction 156°–158° was obtained with a sp. gr. of 0.8635 at 20°, and an $[\alpha]_D = -20.534°$. From this fraction the nitrosochloride was prepared in the usual manner, a yield of about 18.3 p. c. being obtained. The melting point was rather high, viz. 107°. From the nitrosochloride the nitrolbenzylamine base was prepared, which was found to melt at 122°.

The acetic acid was identified in the usual manner. The sodium and silver salts were prepared. The latter upon ignition yielded 64.1 p. c. Ag.

Oil of hemlock distilled in September therefore, consists principally of about equal parts of laevogyrate bornyl acetate and l-pinene. Other substances may be present in small quantity, but could not be isolated from the quantity of material available for this examination. There certainly is a small amount of a strong odoriferous substance present, which gives to the oil its peculiar odor, and which distilled over at least in part with the bornyl acetate when the oil was fractionated under diminished pressure.

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* *Picea alba* Link (White Spruce) or *Picea nigra* Link (Black Spruce).

† Pharm. Rundschau, 13, p. 136.

‡ Schimmel & Co's. Bericht, Oct. 1895, p. 21.

This oil of hemlock, therefore, is very similar in composition to that examined by Bertram and Walbaum, and to the oil of black spruce examined by the writer. A small quantity of oil of white spruce has also been obtained, but not sufficient for examination.

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MONTHLY REVIEW.

Commercial Reports.

Semi-Annual Report of Schimmel & Co. (Fritzsche Bros.), Leipzig & New York.

NOVELTIES.

Celery Oil from green leaves. The same reasons which led us to distill parsley oil induced us to grow a large quantity of celery this summer and to distill the green leaves. The result was an oil which resembled that obtained from the seed only in name, being as unlike to it as possible in all other properties of practical interest. The leaf oil possesses in its entirety the beautiful, powerfully-aromatic odor and the taste of fresh celery leaves and may arouse considerable interest, especially among manufacturers of concentrated soups, and preserved meat and vegetables. The oil-yield of the leaves was 0.1 per cent., representing a comparative strength of the oil to the green leaves equal to 1:1000. We have incorporated celery-leaf oil in our October price list. At present only a few pounds of the article are in stock, but next summer we can place it upon the market in any desired quantity.

The oil is of thin consistency and greenish-yellow color. Its physical constants are as follows: Sp. gr. 0.848 at 15°, opt. rot. + 52° 10′ at 24°. It is soluble in 10 parts of 90 per cent. alcohol.

Essential Oil from Chian turpentine. Essential oil from Chian turpentine has already been prepared by Flückiger, who refers to it at length in "Pharmacographia." This variety of turpentine is produced in the island of Chios in the well-known manner, by incisions in the trunk of *Pistacia terebinthus* L. The total annual production is said to amount to only about 2 cwts. We have distilled a few pounds of the turpentine by way of experiment and obtained about 14 per cent. of an oil possessing an odor resembling that of mace, camphor, and pinene. This yield is almost the same as that obtained by Flückiger, and the specific gravity of our oil (0.868) also closely approaches that of Flückiger's specimen (0.862). The optical rotation, however, shows a more considerable difference. Flückiger records it as + 11.5°, whereas we found it to be + 19° 45′. The oil is not of any practical interest.

Indian-hemp Oil. Vignolo (Gazz. chim. 25, 110) has obtained an essential oil by subjecting the flowering twigs of *Cannabis Indica* to steam-distillation. The oil is of a thin consistency, possesses an agreeable aromatic odor, a boiling point between 248—268°, and does not congeal when cooled down to — 18°. Distillation over sodium yielded a fraction boiling constantly at 256°, which was recognized as a sesquiterpene ($C_{15}H_{24}$) by ultimate analysis and determination of vapor density. No crystalline hydrochloride could be obtained from it.

This communication induced us recently to distill a small parcel of *Herba cannabis indicae*—without flowers, however. The oil yield amounted to 0.1 per-cent. The oil possessed a narcotic, though not disagreeable, odor, it is limpid and does not acquire a buttery consistency at 0°. Its sp. gr. was 0.932.

Melissa Oil from green herb. In our Reports of April, 1891, and October, 1894, we referred at length to the difficulty and costliness of preparing a pure melissa oil; and expressed our intention to make experimental distillations with green material cultivated by ourselves, the manipulation of dried herb having given negative results. These distillations have been made this summer, two different varieties of melissa being employed, viz:

1. Green herb (leaves and stalks) in the beginning of the flowering period. The oil yield was exceedingly small: 0.014 per cent. Specific gravity of the oil 0.924. Opt. rot. + 0° 30′. The oil had a pleasant melissa-like odor.
2. Green herb in full flower. Oil yield 0.104 per cent. Specific gravity of the oil 0.894. Oil optically inactive. The odor is not so pleasant as that of the first-mentioned sample. The presence of citral and citronellal in the oil is plainly indicated by the odor.

Attempted estimation of the aldehyde by Doebner's process produced no definite result, as the acids contained in the oil commenced to melt (in both samples) at about 208°, and only liquefied completely at 225°. We have probably to deal, in this case, with a mixture of the citral-compound (m. p. 197—200°) and the citronellal-compound (m. p. 225°).

The experiments in the distillation of green melissa herb have therefore failed to produce useful results. A pure essential oil from the green herb would be so costly as to preclude altogether its practical employment. But if, as our investigations seem to indicate, the presence in the oil of citral and citronellal may be considered fairly certain, the indirect result of our work would seem to be the probability that a suitable combination of these two bodies may give a substitute for pure melissa oil.

Parsley Oil from green leaves. The circumstance that the parsley oil of commerce, distilled from the seed of the plant, only possesses in a slight degree the genuine odor and taste of parsley, induced us to make an attempt on a somewhat large scale with the distillation of the green herb. The herb used was grown by us on our own plantations at Miltitz. Distillation produced a splendid oil, possessing entirely the natural odor of fresh parsley. This oil may be found very useful in the manufacture of preserved foods or condiments. The oil-yield of the leaves was 0.06—0.08 per cent., consequently one part by weight of oil possesses the intensity of about 1650 parts of green parsley. We have added the oil to our price list, and if it should find a market we can make arrangements for its preparation on a wholesale scale next year.

The oil has thin consistency and a greenish-yellow color. Its sp. gr. is 0.923 at 15°, and its optical rotation +3°10′ at 28°.

Fractional distillation in vacuo gave the following results: —

at	68— 75°	at 13 mm.	....	2 ccm.
"	75— 78°	" 13 "	....	4 "
"	78— 85°	" 12 "	....	10 "
"	85— 96°	" 12 "	....	10 "
"	96—135°	" 12 "	....	3 "
"	135—160°	" 12 "	....	8 "
"	160—170°	" 12 "	....	2 "

About 15 ccm. remained in the flask, and congealed in a freezing mixture. The boiling point of apiol being about 155° at 12 mm, the bulk of that substance would be contained in the sixth fraction. According to Zeizel's methoxyl determination

0.4813 g. oil yielded=0.1973 g. AgI representing 15.17 per cent. of apiol in this fraction. In the fifth fraction

0.3552 g. oil yielded=0.0489 g. AgI corresponding to 4.78 per cent. of apiol in this fraction.

Silaus Oil. This oil, which is obtained by distillation from the fruit of *Silaus pratensis* Bess., an unbelliferous plant which grows wild in Saxony, possesses an odor strongly reminding of estragon (tarragon), but will scarcely be suitable for practical use, as neither its odor nor taste can be called agreeable.

The fruits, distilled with the umbels, yielded 1.4 per cent. of an essential oil of 0.982 sp. gr. The opt. rot. is +0.7° at 20° in a 100 mm tube, the saponification figure was found to be 20.8. When the oil is subjected to cold a stearoptene separates out from it in the form of fine needles.

Menthol. Referring to our Report on Japanese peppermint oil we must also hold out the prospect of higher prices for menthol. For the present, owing to the fact that we own a large stock of cheap raw material, we make no change in our prices. The difference in cost between crude menthol and our re-crystallized pure menthol is too small to cover our expenses. At the present time crude menthol cannot be had below 13/6 per lb. Its re-crystalization causes a loss in weight of about 10 per cent.

The latest issue of the Therapeutischen Monatshefte (No. 9) contains, under the heading: — "Practical notes and useful Formulae" a lengthy report by Dr. Reinhold Wünsche of Dresden, "on the use of menthol in colds and influenza." The author refers to the statement of Ziegler, who showed that peppermint oil, even in a dilution of 1:3000 arrests the development of the comma bacillus, and that, according to Koch, at a strength of 1:2000 it possesses the power of destroying the bacillus of cholera. Rönicke's valuable investigations have shown that the vapour of menthol alone is sufficient to arrest the development of staphylococcus pyogenes aureus and other dangerous bacteria.

In regard to the use of menthol as a remedy for colds, Wünsche expresses himself as follows: —

"Perfumes have often been succesfully used as remedies against colds, from Hager's well-known specific with acid. carbolic. down to Eau de Cologne. According to Roux a similar preparation is administered in the Hôtel Dieu at Paris in cases of cold in the form of energetic inhalations through the nose and mouth. It is said that this application has been uniformly successful in arresting the progress of the complaint, even with patients in whom tracheo-bronchitis always accompanied a cold. I am personally able to vouch for the favorable effect of Eau de Cologne in the initial stage of coryza. As I used to be a frequent sufferer of acute catarrh of the upper air-passages and of true influenza, I have probably experimented on my own person with every remedy that has been prescribed against these complaints.

I have always found menthol, dissolved in chloroform, to be the most efficacious of all remedies.

A solution of 1 to 2 parts of menthol in 20 parts of chloroform will not only arrest the progress of a cold in its initial stage, but is also an excellent influenza prophylatic.

From 4 to 6 drops of the solution should be placed in the hollow of the hand, quickly rubbed between the hands, the two hands tightly pressed together, placed before the face, and the remedy energetically inhaled alternately through the nose and mouth.

It will be immediately noticed that the volatile parts of the solution thoroughly impregnate the mucous membranes of the nose, mouth and throat and even penetrate deep down into the air-passage. During the first two or three inhalations the sweetish chloroform-vapor predominates, afterwards, however, only menthol, in an attenuated condition, is inhaled, odor and feeling remaining apparent for some time after the inhalation.

As a rule, the first inhalation suffices to cure the severest tendency of sneezing, and often to arrest the progress of the cold altogether. Two further applications of the remedy in the course of the day suffice to repress the attack completely.

The first inhalation at first slightly increases the flow from the mucous membrane of the nose; afterwards, however, this symptom diminishes quickly.

Pains in the pharynx and larynx may be quickly eased, and often entirely cured by the remedy.

When, a few months ago, the influenza made its re-appearance, I preserved myself and my family from the epidemic by means of chloroform-menthol inhalations, and this in spite of the fact that I was brought in frequent contact with sufferers from influenza, and that I had fallen a victim to the complaint on every previous occasion of its appearance.

If I should obtain no other satisfaction from these lines than that of having again called the attention of my professional brethren to the usefulness of menthol in cases of acute catarrh, I shall have rendered a service to large numbers of sufferers.

A small vial, containing about 5.0 grammes of chloroform and from 0.3 to 0.5 grammes of menthol should be kept as a cheap and reliable remedy in every household."

Safrol. The latest Reports reviewed from Japan state that camphor oil (which forms the raw material in the preparation of safrol) is becoming scarcer and scarcer, and that small parcels brought to market realized a decided advance in price. It is very likely that the quotation for safrol will soon be raised.

We here beg to give an abstract of a paper by A. HEFFTER (Archiv für experim. Pathologie etc. 35, 342) on the behaviour of safrol and its physiological action on the animal organism. The author states that only a small proportion of the safrol which is introduced into the animal organism is oxidized and may be recovered from the urine in the form of piperonylic acid. The major portion is exhaled through the lungs and leaves the body in the same form in which it was introduced. No glycocoll compounds could be discovered in the urine.

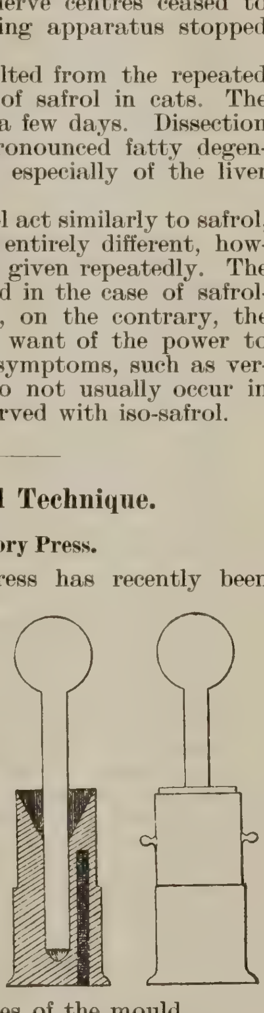
When administered in large doses by the stomach, and particularly when injected into the veins in the form of an emulsion, safrol exercises a powerfully toxic action, which manifests itself chiefly in symptoms of paralysis. Experiments on rabbits showed that the first organ to be affected was the brain, next the nerve centres ceased to act, and finally the breathing apparatus stopped and death ensued.

Remarkable effects resulted from the repeated injection of 1 ccm. doses of safrol in cats. The animals always died after a few days. Dissection revealed a condition of pronounced fatty degeneration of several organs, especially of the liver and kidneys.

Large doses of iso-safrol act similarly to safrol, only weaker. The effect is entirely different, however, when small doses are given repeatedly. The fatty degeneration observed in the case of safrol-poisoning does not occur, on the contrary, the animals generally die from want of the power to assimilate food. Nervous symptoms, such as vertigo, spasms etc., which do not usually occur in safrol-poisoning, were observed with iso-safrol.

Pharmaceutical Technique.

New Suppository Press.



A new suppository press has recently been patented by Ph. H. Schürer of Prague (Austr.), and recommends itself by its simplicity. The principle of this machine can easily be seen by glancing at the accompanying figures. The suppositories are quickly prepared by introducing the mass into the hollow cylinder and compressing it with a twisting downward pressure of the piston. They are then easily taken out by removing the metal cylinder and sliding apart the two halves of the mould.

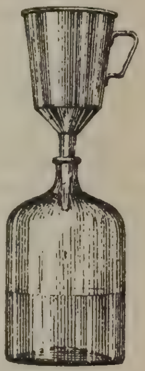
[Pharm. Zeit., 1895, p. 735.]

An Ointment Mill.

A new mill for grinding ointments has been constructed by A. Zemsch in Wiesbaden. The mill is charged automatically with the fat. The pressure can be regulated so that fats of hard or soft consistency can be ground with equal facility. The machine is constructed in different sizes and can be used for grinding chemicals as well.

[Apoth. Ztg. 10, p. 885.]

A New Pharmaceutical Filter.



Böhm's patented handfilter, especially adapted to the wants of the pharmacist, is shown in the accompanying figure. Into the slightly conical upper portion of the enameled filter-funnel, a finely perforated enameled disk is introduced. Upon this is placed an aluminum sieve to support the filter-medium, which consists of chemically pure plant-fibres (probably paper-pulp) which are distributed uniformly over the sieve. The filter-medium comes in the form of white compressed cakes, which are boiled in water, and the resulting thick magma is used. To prevent the rising of the filter-mass when the liquid is poured on, it is covered with a flannel disk and an enameled plate. The filter is especially adapted for the filtration of tinctures, juices, liquors, fixed oils, etc.

[Pharm. Zeit., 1895, p. 735.]

Chemistry.

Boric Acid in Acidemetry.

E. P. Pennan and W. John recommend boric acid for the titration of acids. One molecule of borax is neutralized by one molecule of sulphuric acid when methyl orange is used as indicator. The advantage of the borax solution lies in the fact that in well stoppered bottles it can be kept without change. Boric acid does not act on methyl orange and the final reaction is sharp.

[Chem. News 71, p. 296.]

Estimation of Sugars by means of Copper-potassium carbonate Solution.

The unsatisfactory results formerly obtained by means of this reagent have been corrected by making a slight change in the composition of the solution. According to H. Ost, the improved solution is prepared by dissolving 17.5 g. crystallized copper sulphate, 250 g. of normal potassium carbonate, K_2CO_3, and 100 g. acid potassium carbonate, $KHCO_3$, in sufficient water to make a liter. Such a solution was found to give satisfactory results even after standing three and a half years. A table of sugar equivalents will be found in the original.

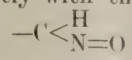
[Chem. Ztg. 19, pp. 1784 and 1829.]

On the Chemical Composition of several Volatile Oils.

A. C. Chapman has prepared several derivatives of humulene, a sesquiterpene from oil of hops. A nitroso chloride was prepared and from this a nitrol benzylamime base. The nitrosate, which melted at 162—163° was converted into a nitrol piperidine base. A nitrosite was obtained in two modifications: a blue one melting at 120—121° and a colorless one melting at 166—168°. The former is converted into the latter by repeated crystallization from alcohol. The author states that his nitrosate resembles the caryophyllene nitrosate obtained by Wallach.

The most interesting observation is the change of the blue nitrosite into the colorless modification.

This seems to be the first instance in which a compound apparently with the group



$$-C<\begin{matrix}H\\N=O\end{matrix}$$

has beeen isolated.

[Journ. Chem. Soc. 1895, p. 780.]

A. Reychler has isolated from cananga essence a substance that appears to be identical with linalool, and another which he pronounces to be the methyl ether of para methyl phenol.

[Bull. Soc. Chim. (3) 13, p. 140.]

Disinfection of Plants.

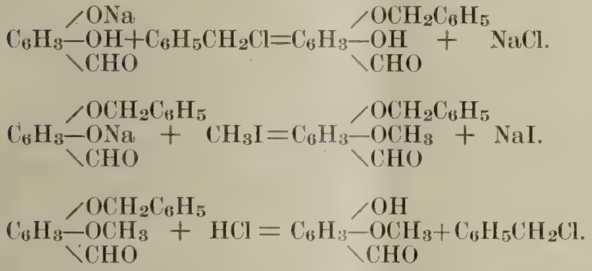
(G. I. P. No. 83058.)

In order to counteract the detremental effect of formic aldehyde (formaline) on plants they are exposed to ammonia vapors, which decomposes the formic aldehyde. The plants are placed in a cylinder into which first the vapors of formic aldehyde are passed, then those of ammonia. It is claimed that the ammonia combines in the cells with the formic aldehyde forming here a methylene tetramine, and that this has a beneficial effect on the growth of the plants and the capacity for germination of the seeds.

[Ber. d. d. Chem. Gesellsch., 28, Ref., p. 940.]

Preparation of Vanillin and its Homologues.

The *Chemische Fabrik auf Actien* has had several new processes patented according to which vanillin and its homologues can be prepared. The monosodium salt of protocatechuic aldehyde is converted into the para benzyl ether ($OC_7H_7:CHO = 1:4$; m. p. 122°) and then methylated. This vanillin benzyl ether is heated with hydrochloric acid, which resolves it into vanillin and benzyl chloride.



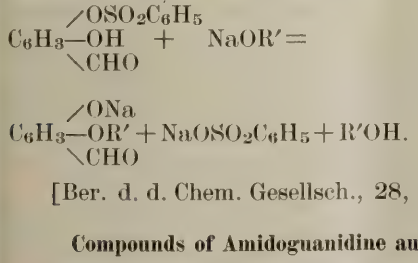
$$C_6H_3\begin{matrix}\diagup ONa\\-OH\\\diagdown CHO\end{matrix}+C_6H_5CH_2Cl=C_6H_3\begin{matrix}\diagup OCH_2C_6H_5\\-OH\\\diagdown CHO\end{matrix}+NaCl.$$

$$C_6H_3\begin{matrix}\diagup OCH_2C_6H_5\\-ONa\\\diagdown CHO\end{matrix}+CH_3I=C_6H_3\begin{matrix}\diagup OCH_2C_6H_5\\-OCH_3\\\diagdown CHO\end{matrix}+NaI.$$

$$C_6H_3\begin{matrix}\diagup OCH_2C_6H_5\\-OCH_3\\\diagdown CHO\end{matrix}+HCl=C_6H_3\begin{matrix}\diagup OH\\-OCH_3\\\diagdown CHO\end{matrix}+C_6H_5CH_2Cl.$$

According to another process vanillin can be obtained from eugenol and isoeugenol in a rather round-about manner. For details see the original.

The homologues of vanillin can be obtained from p-benzene sulphoprotocatechuic aldehyde or its salts by treating the same with sodium alcoholate.



$$C_6H_3\begin{matrix}\diagup OSO_2C_6H_5\\-OH\\\diagdown CHO\end{matrix}+NaOR'=$$

$$C_6H_3\begin{matrix}\diagup ONa\\-OR'\\\diagdown CHO\end{matrix}+NaOSO_2C_6H_5+R'OH.$$

[Ber. d. d. Chem. Gesellsch., 28, Ref., p. 878.]

Compounds of Amidoguanidine and Sugars.

Amidoguanidine was introduced as a reagent for carbonyl oxygen only a year or two ago. Baeyer used it successfully as a reagent in his researches on terpenes and derivatives. It is now also applied in the study of sugars. Crystalline derivatives of glucose, galactose and milk sugar have thus far been prepared by H. Wolff.

[Ber. d .d. Chem. Gesellsch., 28, p. 2614.]

Botany and Pharmacognosy.

The Action of Hydrogen Sulfid on Plants.

Experiments by Barnouvin on strawberry plants showed that hydrogen sulfid acts as a poison to plants as well as to animals. The leaves show yellow spots and later the death and complete drying up of certain parts of the leaves follow, when they are exposed for several days to the action of a mixture of this gas and atmospheric air. On being returned to pure air, they gradually recover. If they are exposed in a close space to the action of the pure gas, in twenty-four hours the leaves become brown or black, dry up and die.

[Répert. de Pharm., 1895, p. 386, and Pharm. Centralb., 36, (1895) p. 702.]

The Translocation of Calcium Phosphate in the Plant.

During the development of the seed as is well known, the mineral elements of the plant wander from leaf and stem to the seed, and, during germination, travel out into the seedling. The transportation of soluble materials such as the sugars, is easily understood. How this takes place with insoluble substances such as the phosphates is the subject of an investigation by M. L. Vaudin. From the author's experiments, it appears that at the time of harvest, only traces of succinic acid are found. During germination, however, hydration- and oxidation-changes occur, the starch granules are changed to sugar, the succinic acid disappears, giving place to malic acid, the salts of which alone are found during the vegetative period which precedes the development of seeds. During the process of ripening, when the young grain is in the "milky" stage, succinic acid again appears, probably as a result of the reduction of the malic acid. As the author has previously shown, the sugars are able in the presence of malic salts to hold calcium phosphate in solution, whereas the salts of succinic acid do not possess this ability. Accordingly, the sugars formed in the leaves wander to the seed and the alkali salts of malic and phosphoric acid carry with them insoluble phosphates. Upon the change of the sugars to starch, they drop the basic lime salts; at the same time the malates are almost completely broken down and are changed in small part to succinates. The rôle played in the *Gramineæ* by the malates is taken in other families, particularly in the *Leguminosæ*, by the citrates.

[Chem. Zeitung, 1895, p. 335, and Pharm. Zeitung f. Russland, 34, (1895) p. 710.]

The Adulteration of Ground Pepper.

In order to detect ground olive seeds, the shells of almonds and of other nuts, as well as of all similar lignified materials, Martelli makes use of the microchemical reaction for lignin recommended by Wiesner, phloroglucin. He dissolves about 1 gr. phloroglucin in 50 to 60 cc. hydrochloric acid (sp. gr. 1.1) by allowing it to stand 1 to 2 days. In a flat porcelain dish, he puts 0.5 g. of the pepper to be investigated, moistens the same with the turbid phloroglucin solution and warms cautiously until vapors of hydrochloric acid are given off. By this treatment, bodies containing lignin assume a strong cherry-red color which can be detected by the unaided eye, while the particles of pepper assume colors varying from a yellowish to a reddish-brown. By washing and decanting, a reddish violet powder remains consisting almost entirely of the foreign substances.

[P. Staz. Spermient. Agrar. Ital., (1895), p. 53, and Pharm. Centralh., 36, (1895), p. 701.]

The Source of the Toxic Action of Arum maculatum, *L.*

After reviewing the literature bearing on the source of the toxic action of *Arum maculatum*, L., Dr. Aug. Schneegans reports results of his own investigations favoring the view that it lies in the presence of saponin as contended by Waage (1), and Spica and Biscaro (2), and not in the action of needle-shaped crystals of calcium oxalate as thought by Greshoff (3). After describing the method of treatment yielding saponin, the opinion is expressed that the therapeutic effectiveness of this plant is to be ascribed to this body.

The favorable action of *Arum* (*Arisæma*) *triphyllum* in catarrhal troubles as observed in North America is thought to be probably also due to contained saponin. In this connection may be cited the observation of Barnes (4) that the juice of this plant loses its acridity on filtering out the raphides.

Attention is called to the fact that both *A. maculatum* and *A. esculentum* when prepared by carefully washing out the harmful principle serve as food. The latter species is one of the important sources of nutriment in the Polynesian Islands where the tubers contain as high as 33 per cent starch. A somewhat analogous case is seen in the manioc plant (*Manihot utilissima*) which on careful washing and heating yields the tapioca of commerce.

[Journ. d. Pharm. v. Elsass-Loth., 22, (1895), p. 295.]

Occurence of Methyl Salicylate in Species of Polygala.

To the number of species of *polygala*, yielding methyl salicylate, P. van Romburgh has added one more, viz. *Polygala variabilis albiflora*. The same ester has been found in the roots of *P. Senega* L., *P. alba*, *P. tenuifolia*, *P. oleifera* Heckel and *P. javana*.

[Rec. trav. chim. des Pays-Bas, 13, p. 421.]

The Carbohydrates of the Gum of Acacia decurrens.

According to W. E. Stone this gum resembles gum arabic and cherry gum not only as to outward appearance, but also as to chemical composition. The solution of the same is slightly acid and is optically laevogyrate. Lead acetate and alcohol produce produce precipates. The carbohydrate is of the character of a galacto-arabene. Hydrolysis yields arabinose and galactose.

[Am. Chem. Journ. 17, p. 196.]

Preparation of Guttapercha.

The preparation of guttapercha from leaves was described in this journal (p. 19). *H. E. Sérullas* of Paris has recently had an improved method of extraction patented. Before the guttapercha is extracted the leaves are digested with a three percent solution of alkali under pressure. The tissue is thereby destroyed, thus facilitating the extraction of the guttapercha with toluene or benzene.

[Ber. d. d. Chem. Gesellsch., 28, Ref., p. 1035.]

Practical Pharmacy.

Multiplication of Remedies.

Some time ago a protest was made in the Pharm. Zeitung against the flooding of the market with preparations, that, when deprived of their high-sounding names, appear as old acquaintances, or as more or less superfluous derivatives of well-known medicinal substances; superfluous, because they do not excel these except in a higher-sounding name, or perhaps in price. The list of medicines containing antipyrin, already large and constantly increasing, shows well the tendency of inventors to enlarge our list of remedies, all of course, only in the interest of suffering humanity.

Antipyrin owes to its therapeutic success, as well as to the pecuniary benefits accruing to its manufacturers, the fact that it has again and again been brought out under new names. Up to the present time, the following titles have been applied to this substance: *Antipyrin*, *Analgesin*, *Anodynin*, *Metozyn*, *Parodyn*, *Phenazon*, *Phenylon*, *Pyrazin*, *Pyrazolon* and *Sedatin*.

Soon after antipyrin had commenced its triumphal march, one of our manufacturing houses conceived the happy thought of combining antipyrin with salicylic acid. The good results obtained with *Salipyrin* have, for the same reasons as with antipyrin, already given it several names (*Salazolon*, *Salipyrazolin*); at the same time their good results probably were the cause of that feverish search for other profitable discoveries in the chemistry of antipyrin, that was soon to follow.

Of the salts of antipyrin may be mentioned *Tussol*, (i. e., mandelate of antipyrin), which was so much advertised a short time ago. Perhaps e'er long we will see the hither-to neglected citrate of antipyrin in a new edition and with beautifully sounding name; for has not citric acid only recently proven itself so flexible in enriching the remedies of the phenetidin group (*Citrophen* and *Apolysin*), and surely the desire for imitations is scarcely anywhere greater than in the "domain of the synthetic remedies."

A very large field of action, to which special attention is hereby drawn, is furnished by the combinations of the phenols with antipyrin; as far as we know there are at present:

Phenopyrin, from Phenol and Antipyrin;
Picropyrin, from Picric Acid and Antipyrin;
Resorcinopyrin, from Resorcin and Antipyrin.
Resorcylalgin, from Resorcylic Acid and Antipyrin;
Pyrogallopyrin, from Pyrogallol and Antipyrin;
Naphtopyrin, from B. Naphtol and Antipyrin.

As to their application in medicine, things look rather dubious as yet with these, but the phenol group is large; surely some combination can yet be found of wonderful antirheumatic or antineuralgic actions.

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(1) Pharm. Centralh., 1892, No. 45—49 and Pharm. Centralh., 1893, No. 10.
(2) Annali di Chimica, Med.-Farm., 1885, p. 92.
(3) Pharm. Centralh., 1892, No. 51.
(4) Bot. Gaz., 13, (1888), p. 232.

Of course, simple mixtures also suffice, as the following indicate:

Antisemicramin, a mixture of antipyrin, caffeine and sugar;

Bromopyrin, a mixture of antipyrin, caffeine and sodium bromide;

Migränin, a mixture of antipyrin, caffeine, and citric acid;

Pelagin, a mixture of antipyrin, caffeine and cocaine.

Also the two latest remedies containing antipyrin,

Antipyrinsalol, made by melting together antipyrin and salol; and

Cocapyrin, a mixture of antipyrin with cocaine hydrochlorate,

belong to this latter category.

To be thorough, although refraining from mentioning any of the true substitution derivatives of antipyrin, we must add

Hypnal, (i. e., monochloral antipyrin),

Bichlor antipyrin,

Dehydrochloral antipyrin,

Ferro and *Ferripyrin*, (combinations of antipyrin with chlorides of iron);

whose right to exist cannot be questioned.

Whether there has been a real need for all these preparations, or whether the wants of medicine would not have been as well subserved with antipyrin and salipyrin (with possibly ferropyrin added), is a question which scarcely requires the decision of a therapeutist; an apothecary too can find the correct solution if he glances at his collection of rarities and antiquities, in which, besides numerous other short-lived remedies, many of the antipyrin-containing medicines may already be found. [Pharm. Zeit., 1895, p. 737.]

Iodoformin.

Iodoformin is considered by E. Konteschweller to be a combination of iodoform with hexamethylen tetramine [Pharm. Centralb., 1895, p. 46]. This latter preparation combines with iodoform, molecule for molecule, so that the resulting body contains 75% of iodoform, the same as does iodoformin. The author obtained this combination by treating an alcoholic solution of 70 gms. of iodoform with an alcoholic solution (1—14) of 30 gms. of hexamethylen tetramine, and drying the resulting precipitate between filters. The substance so obtained was in the form of a fine, white powder, odorless, but splitting off iodoform and acquiring the odor of this substance when brought in contact with water.

[Pharm. Zeit., 1895, p. 761].

Nicotiana Soap.

Tobacco wastes have been used extensively for the preparation of an extract, which is used on sheep in the treatment of skin diseases. Mr. Mentzel, an apothecary in Bremen, has prepared a soap containing tobacco extract for the treatment of parasitic skin diseases of man.

A sufficient quantity of tobacco extract, containing from 7 to 9 p. c. nicotine, is added to the soap so that the finished product contains 10 p. c. extract or about 0.7 p. c. nicotine. The resulting soap has a brownish-black color and is perfumed with bergamot oil.

[Pharm. Centrh. 36, p. 745.]

Detection of Asaprol.

Asaprol or Abrastol, the calcium salt of naphtosulphuric acid, is said to be used extensively for the preservation of foodstuffs and beverages. According to Bellier the presence of the same in wine can be determined according to the following method: 50 cc. of wine are rendered alkaline with ammonia and shaken with amyl alcohol, which dissolves the asaprol. The solution of amyl alcohol is evaporated on a water bath. To the residue 1 cc. of nitric acid and 1 cc. of water are added. The mixture is again heated until about 1 cc. remains. This is transferred to a test tube with the aid of a little water. 0.2 g. of ferrous sulphate is dissolved in the solution and slight excess of ammonia is added while shaking. Then 5 cc. alcohol are added and finally a few drops of sulphuric acid. The precipitate is removed by filtration. In the absence of asaprol the filtrate is colorless or of a slight yellow color, in the presence of the same the filtrate is colored more or less red.

Salicylic acid produces a similar color. The residue after the evaporation of the amyl alcohol produces a violet color with ferric chloride, which remains constant upon heating, if salicylic acid is present; whereas asaprol produces a blue color, which disappears upon boiling.

[Répert. d. Pharm., 1895, p. 106.]

New Method for the Estimation of Caffeine in Tea.

A comparatively simple and apparantly accurate method has been devised by van Ledden-Hulsebosch.

5 g. of the pulverized tea are mixed with 1 g. of calcium hydroxide and 100 cc. of water in a tared Erlenmeyer flask and heated for three hours on a water bath. Upon cooling, the original weight is restored and the mixture is filtered. In 50 cc. of the filtrate 0.5 g. of anhydrous sodium carbonate are dissolved. The resulting precipitate is removed by filtration and washed with a little water. The filtrate is evaporated to about 15 cc. This together with the water necessary to rinse the dish are transferred to a perforator and the combined liquids perforated with ether for three hours.

The caffeine, which results upon the evaporation of the ether, is snow-white and is dried at 100°. A specimen of tea, which according to Herlant's method contained 2.42 p. c. caffeine, yielded 2.58 p. c. The author intends to extend his method so as to include coffee, cocoa and cola.

[Pharm. Centrh., 36, p. 742.]

Food Stuffs.

Changes in the Chemical Composition of Wine caused by the Addition of Alum.

According to F. Sestini the addition of alum to wine is accompanied by the gradual formation of a precipitate, which consists principally of aluminium phosphate. The addition of alum to wine can, therefore, not be recognized by the presence of an unusually large amount of aluminium, but rather of sulphuric acid and of volatile acids. In as much as the addition of alum causes the abstraction of phosphoric acid and a substitution of sulphuric acid in place of the former, it should not be permitted.

[Gazz. Chim. 25, II, p. 257.]

Detection of Formic Aldehyde in Milk.

According to R. T. Thompson a forty per cent formalin solution is four times as strong as a milk preserving agent than boric or salicylic acids. It can therefore be used advantageously to preserve milk for chemical analysis, but should not be added to milk intended for consumption.

To detect formic aldehyde in milk 100 cc. of the latter are distilled until 20 cc. of distillate are obtained. About five drops of ammoniacal silver nitrate solution, containing about 2 p. c. of silver nitrate and but a slight excess of ammonia, are added to the distillate contained in a flask provided with a glass stopper. The mixed solutions are set aside in the dark for an hour. If formic aldehyde is present the solution will become blackened or a black precipitate will be formed. The presence of 30 mg. of a 40 p. c. formalin solution in 1 liter of milk can be detected in this way. The distillate from pure milk remained unchanged even after 24 hours.

[Chem. News, 71, p. 247.]

Sanitation and Hygiene.

Ammonia in Drinking Water.

Dr. S. Paul Liechti has observed that corks have the property of absorbing ammonia from the atmosphere. In consequence, pure water that has been in contact with new, clean corks may produce a reaction for ammonia. Corks to be used as stoppers for jars or bottles containing water to be examined should, therefore, be boiled before they are used.

[Schweiz. Wochensch. f. Chem. und Pharm., 1895, p. 436.]

A Color-Reaction on a Large Scale.

In order to decide the source of a water supply, potassium fluorescëin apparently will do better service than eosin. A very interesting description of its application is given by Dr. Jehn. 2 Ko. of potassium fluorescëin traversed a distance of 8 km. underground in twenty-five hours and colored the *Ahn* beautifully green for twelve hours. Although in a test tube the fluorescence is visible in a dilution of 1 : 10,000,000 the dilution in the river was estimated to be about ten times greater.

[Apoth. Ztg., 1895, p. 831.]

Bacteriology.

A Red Pigment from Bacteria.

Under the name "Aug-Khak", the Chinese in Java and other of the Sunda Islands, the retail trade of which lies almost completely in Chinese hands, bring on the market a pigment for the coloring of foods which gives a very showy red color. Recently it has become known that this coloring-matter is prepared in a very interesting manner by the Chinese. It is by the propagation of certain bacteria which grow readily on all starch-containing substances. In China, particularly in the province of Canton, this microbe is cultivated on rice which has been ground and boiled. The freshly prepared rice is inoculated from an older culture, after which, in the course of six days, an abundant development of the pigment-forming bacteria is obtained. Growth takes place best in a cool, damp place and only in a good air supply, for which reason the rice preparation is spread out in plates in as thin layers as possible. Along with this form, other bacteria, however, develop. To hinder this, the Chinese add to the rice a small quantity of arsenic which kills the harmful bacteria without influencing the pigment-formers. The preparation of this coloring matter is a very old industry in China. It appears, therefore, that the Chinese in this supposedly modern practice of obtaining pure cultures for industrial purposes, were really our predecessors by some centuries. Of course, they arrived at this practice in a purely empirical way without any appreciation of the essential processes involved.

[Apoth. Zeit. 10, (1895) p. 916.]

Physiology, Pharmacology and Therapy.

A Physiological Andidote.

By mistake C. Binz injected into a patient four times the maximum dose of atropine. He soon noticed the mistake and injected a somewhat smaller dose of morphine. On the one hand the usual irritating effect of the atropine was not observed, on the other, the action of the morphine was very mild. In spite of the comparatively large dose the antagonistic effect of both alkaloids was demonstrated almost to perfection.

[Berl. klin. Wochenschr. 1895, p. 997; from Chemiker Ztg. 1895, p. 383.]

Prophylaxis and Therapy of Diphtheria.

Therapeutic serums are about in the same stage of development as were alkaloidal vegetable drugs at the beginning of this century before the discovery and isolation of the alkaloids. As a result even such physicians and therapists, as recognize the full value of the serum therapy, have not given up entirely the use of older remedies or the search for new ones.

Dr. N. Rosenthal [Therapeutische Monatshefte, 1895, p. 262] claims that ferric chloride, an old remedy against diphtheria, may be considered as a specific. He positively asserts that ferric chloride prevents the secondary larynx diphtheria, and that as far as a cure is concerned better results have been achieved than with any other remedy. Of 271 patients treated but 8.2% died. Even Loeffler is mentioned as one favoring the ferric chloride treatment.

Very striking results have also been obtained by Dr. S. Schwarz [Wiener klin. Wochenschr., No. 43, 1895] with sodium sozorodol by direct insufflation with a paper tubule. The total mortality, including patients received at a late hour or living under poor hygienic conditions, did not exceed 8—10%; whereas the mortality of patients treated immediately upon taking sick, was as low as 2—3%. Inasmuch as Behring's serum acts only on Loeffler's bacillus and not on streptococci, etc., and since the presence of Loeffler's bacillus can be ascertained only upon bacteriological examination, the value of a local antiseptic of general application is apparent. Furthermore it is ofttimes impossible to obtain fresh, reliable serum. Even those who can obtain the same and have the means of making a differential diagnosis, may use both serum and sodium sozorodol to advantage.

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CHICAGO.

Hydrophobia and Vaccination.

During the year 1894, 323 persons who had been bitten were brought to the *Kaiserl. Inst. f. Experimental medizin* at St. Petersburg. Of this number 99 were not vaccinated, partly because the animals who had bitten them were healthy, partly for other reasons. Of the number treated three died of hydrophobia, the others recovered. The treatment lasted from seven days to more than a month.

In Odessa 1000 persons were treated according to Pasteur's method. The death rate was as low as 0.32 p. c.

[Apoth. Ztg., 1895, p. 848; from Arch. des Sciences Biolog., Tome IV., No. 1.]

The Hot Caves of Monsummano.

A short time ago general attention was called to a new method of healing, the frigotherapy of Prof. Raoul Pertet, which may result in the erection of a *Kälte Klinik* in Berlin. Attention is now being called to a therapeutic agent of the other extreme, viz. the hot caves of Monsummano, Italy. These caves were accidentally discovered in 1849 by laborers quarrying rock on the farm of Domenico Giusti, father of the Italian poet Giuseppe Giusti, whose satires were such an important factor in the political development of Italy. Laborers suffering from rheumatism found relief while remaining in the cave. The news of these accidental cures soon spread abroad. The grandduke of Tuscany came to see the miracle. Garibaldi and Kossuth were among the first patients who came to seek relief: the former from a wound received at Aspromonte, the latter from cephalalgia. Patients enter the cave clad only in a light white garb. The three larger appartments of the grotesque cave, which has been made accessible for a depth of 277 meters, are known as *il paradiso, il purgatorio* and *l'enferno* respectively. The temperature is about 31°C and the atmosphere is saturated with moisture, yet breathes freely. The rock is very porous and there appears to be an abundant circulation of pure air. After a few minutes the patient begins to perspire and soon perspiration begins to pour from all parts of the body. These baths last from half an hour to several hours. This treatment may readily be made to account for the fact that Monsummano, although highly interesting as an object of nature and full of mystery to the general public, has not become a fashionable summer resort. As the name of the second grotto indicates it rather appears to be an assembly for such men as have indulged too freely in some of the luxuries of life. Nevertheless the suffering poor may seek relief from rheumatism and the after effects of influenza as well as the penitent rich from gout.

A Double Antitoxin.

It has been known that in cases of diphtheria the disease is not always caused by the presence of the Loeffler bacillus only, but that streptococci often complicate the same. The diphteria antitoxin thus far prepared is a specific against the disease produced by the Loeffler bacillus, but is without effect on that form of the disease caused by the streptococci. European scientists have, therefore, experimented in the direction of preparing a serum having antitoxic properties against both the Loeffler bacillus and the streptococcus by immunizing the same animal against both poisons. The results of these experiments appear to have been successful if recent announcements prove correct. It is stated, that it requires a period of one year to immunize a horse against streptococcus, an immunizing power of 1:30,000 being reached.

Pharmaceutical Societies.

International Pharmaceutical Exposition.

The second international pharmaceutical exposition in Prague will be held from August 15, to September 15, 1896, in the *Haupt-Ausstellungs palast im Baumgarten*. The exhibits will comprise the following groups:

I. Scientific apparatus and appliances used in pharmacy and allied branches.
II. Pharmaceutical literature and literature of allied sciences.
III. Machines and apparatus used in the manufacture of pharmaceutical preparations.
IV. Equipment of pharmacies.
V. Drugs, chemicals and pharmaceutical preparations.
VI. Books, statistics, apparatus, utensils, etc., illustrating the historical development of pharmacy.
VII. Pharmaceutical corporations and societies.
VIII. Hygiene and care of the sick.
  1. Equipment of homes and utensils from a hygienic standpoint.
  2. Clothing.
  3. Foodstuffs.
  4. Disinfection, perfumery, chemicals for the purification of water and air, illumination, heating and ventilation.
  5. Articles of toilet with reference to health.
  6. Popular scientific treatises on hygiene, first aid in care of accidents.
  7. Hygienic equipment of hospitals and lifesaving stations, sanitary appliances for the transportation of the sick.
  8. Bacteriological and microscopic preparations.
  9. Hygienic preventives.
  10. Mineral waters and their products.
  11. Balneology and gymnastics.

Further information can be had, upon application, from the chairman of the executive committee, Dr. K. Fragner, pharmacist in Prague, 203—III.

Congress for Applied Chemistry.

The second international congress for applied chemistry will be held next summer in Paris, also an exhibit of chemical and agricultural industry. There will be ten sections including medical and pharmaceutical chemistry.

Personals.

Mr. C. G. Lloyd, co-editor with Prof. J. U. Lloyd of "Drugs and Medicines of North America," is on a several months' tour to the Barbadoes Islands collecting fungi.

Dr. Hermann Hager.

On the third of January the veteran pharmacist of Germany celebrated his eightieth birthday. Possibly no pharmaceutical writer is more universally known among practicing pharmacists the world over than Hager. That self-made men are possible in Germany as well as in this country has been demonstrated by the career of this profuse writer. At the age of sixteen he left school and entered a pharmacy as apprentice only to learn that even in those good old times a pharmaceutical apprenticeship involved much unpleasant drudgery and practically little time for study. Yet circumstances forced him to resign all scientific aspirations for the time. The craving to learn something, and his great diligence, however, enabled him to pass successfully the state board examination at Berlin without having been able to attend a regular course of study at a university. Even as an apprentice he found time for literary activity and during the seventeen years while he was proprietor of a pharmacy he was constantly busy educating himself and writing. When he retired from active business it was done to have all of his time for his intellectual advancement and the writing of books or editing of journals. He founded and for twenty years edited the Pharmaceutische Centralhalle.

Work was his recreation and work was his delight. For a number of years he lived in the quiet of Bunzlau, but since 1883 he resides in Frankfurt on the Oder.

On the merits of his works the philosophical faculty of the University of Jena conferred upon him the degree of Ph. D., and the medical faculty conferred upon him the degree of M. D., *honoris causa.* Hager is not only honorary member of a number of European societies, but also of the American Pharmaceutical Association and several colleges of pharmacy, viz. those of Chicago, Massachusetts and Philadelphia.

Universities and Colleges.

Curator of the Fielding Herbarium.

By a recent decree of convocation of the University of Oxford, the office of Curator of the Fielding Herbarium has been duly constituted, and this has been followed by the election of Mr. G. Claridge Druce to the post. Mr. Druce, who is well known as a pharmacist and an examiner to the Pharmaceutical Society, is an honorary M. A. of the University of Oxford. He is also the author of a Flora of Oxfordshire, and is at present engaged in the compilation of a Flora of Berkshire.

Philadelphia College of Pharmacy.

The Philadelphia College of Pharmacy at a meeting held Dec. 30, elected Dr. Frederick Hoffmann as honorary member of the college.

Pharmaceutical Chemistry at the University of Berlin.

A part of the chemical laboratory of the *Landwirthschaftliche Hochschule* has been set aside as a pharmaceutical laboratory. The director of the same, Privat docent Dr. Thoms, will deliver courses of lectures on pharmaceutical and forensic chemistry, also on the chemistry of foodstuffs. The present arrangement is only a temporary one. It is rumored that the prospective pharmaceutical institute may find a permanent home in the new botanical garden of the university.

Jurjew (Dorpat).

Mag. J. Kondakow has been appointed extraordinary professor of pharmacy in place Prof. G. Dragendorff. The number of pharmaceutical students, or more correctly *Zuhörer der Pharmacie,* during the present semester is 237, against 277 last year.

Buda-Pest.

The university senate is of the opinion that such women as have had the required preparation, should be admitted to the study of pharmacy. The question whether women should be admitted to pharmacy has been freely discussed of late by the political press of Hungary. The Hungarian apothecaries' society has recently placed itself on record as being opposed to the admission of women to their profession.

In Memoriam.

Dr. Sickenberger, professor of botany and chemistry at the medical school at Cairo, Egypt, died in December of last year. He was known to pharmaceutical students principally through his articles on Arabian drugs.

Literary.

Books and Pamphlets Received.

Art. Institut Orell Fuessli—Zuerich. Commentar zur Pharmacopœa Helvetica, Editio Tertia. Von Dr. Carl Duennenberger, Apotheker. pp. XV, 428. 1896. $4.80.

Felix Alcan—Paris. Dictionnaire de Physiologie. Par Charles Richet, Professeur de Physiologie à la Faculté de Médecine de Paris. Tome premier. 2^{e} Fiscicule, pp. 337—672. Aliments—Aristote. 1895. 8 fr. 50 centimes.

Felix Alcan—Paris. Dictionnaire de Physiologie. Par Charles Richet. Tome premier. 3e Fiscicule, pp. 673—1046. Arloing (s)—Bactéries. Avec table des matières du premier volume. 1895. 8 fr. 50 centimes.

Wilhelm Knapp—Halle. Lehrbuch der praktischen Photographie. Von Dr. Adolph Miethe. 440 Seiten, mit 170 Illustrationen. 1896.

Bibliographisches Institut—Leipzig. Meyers Konversations-Lexicon. 5. Aufl., Bd. 10. Kaustik—Langenau. 1060 Seiten mit zahlreichen Illustrationen. 1895.

Vandenhoeck und Ruprecht—Goettingen. Jahresbericht der Pharmacie. Herausgegeben vom Deutschen Apothekerverein. Bearbeitet von Dr. H. Beckurts. 29. Jahrgang, 1894. (Der ganzen Reihe 54. Jahrgang.) Ein Bd. pp. VI, 894. 1895. $7.20.

Julius Springer—Berlin. Vierteljahresschrift über die Fortschritte auf dem Gebiete der Chemie der Nahrungs- und Genussmittel, der Gebrauchsgegenstände sowie der hierher gehörenden Industriezweige. Redigirt von Dr. A. Hilger, Professor an der Universität München. Zehnter Jahrgang. Das Jahr 1895. Drittes Heft. pp. 321—483.

P. Blakiston, Son & Co.—Philadelphia. Outlines of Materia Medica and Pharmacology. A text-book for students. By H. M. Bracken, M. D., Professor of Materia Medica, Therapeutics and Clinical Medicine, University of Minnesota. One vol., pp. 383. 1895. $2.75.

Author—Lavoisier. President's Address before the Indiana Academy of Science. By W. A. Noyes. Pamphlet, pp. 11.

University of Wisconsin—Madison. The Conn Culture (B 41) in Butter Making. Bulletin* No. 48 of the Agricultural Experiment Station. By E. H. Farrington and H. L. Russell. Pamphlet, pp. 22. 1896.

Reviews.

Commentar zur Pharmacopœa Helvetica. Editio tertia von Dr. Carl Duennenberger, Apotheker. Druck und Verlag: Art. Institut Orell Fuessli in Zürich, 1896, pp. XV, 428. $4.80.

The third edition of the Swiss Pharmacopœia which went into effect July 1st, 1894 was reviewed in a verry able manner by Dr. Charles Rice, (Pharm. Rundschau, 1894, pp. 63 and 82) whose duties as chairman of the Revision Committee of the United States Pharmacopœia especially qualified him for such a task. Calling attention to the excellent work of the publisher, Dr. Rice makes the following statement: "Jedenfalls sind weder Mühen noch Kosten gescheut worden, um dem Buche ein würdiges Aeussere zu geben. Keine andere bisher erschienene Pharmacopöe kann sich in dieser Hinsicht mit der hier besprochenen messen."

From the same publishing house, a commentary on the Swiss Pharmacopœia has now appeared. The above quoted sentences of Dr. Rice apply with equal force to this work.

The titles of those substances which are classed with the *Separanda* of the pharmacopœia are printed with red ink, e. g. *Acidum hydrochloricum*, *Extractum Strychni*, etc.; whereas, the titles of those substances which are enumerated as *Venena* are characterized by white letters on a black background, e. g. *Kalium arsenicosum solubum*, *Strychninum nitricum*, etc. The table of reagents is printed on red paper so that it can be consulted readily.

The striking features of this book, however, do not lie solely in the workmanship of the printer and publisher. Possibly less than any other pharmacopœial commentary does this one replace the pharmacopœia which serves as its basis. If the authors of the third edition of the Swiss Pharmacopœia profited by recent editions of other pharmacopœias, commentators of pharmacopœias the world over and particularly in this country can learn much from Dr. Duennenberger's work. The entire replacement of a pharmacopœia by a commentary does not only involve the ethical phase of authorship and copyright, but an educational factor as well.

The difference between this and other pharmacopœial commentaries is brought out very strongly in the omission of all mere description of vegetable and animal drugs. In as much as the commentator can improve but little, if any, on such descriptive portions of pharmacopœial text, there is little sense in reproducing the same. This is equally true of much of the text on galenical preparations. A general description of the process of preparing tinctures can be given under the general heading *Tincturae*. Consequently there is no need of reprinting the pharmacopœial text under every new heading, except where special differences from the general rule call for special comment.

It is quite different with the characterization of chemicals. This is partly positive, characterization as to identity; partly negative, characterization of impurities. Although it is generally taken for granted that such descriptions are self-explanatory this is by no means always the case. Dr. Duennenberger's commentary is therefore largely a chemical work. This chemical commentary does not only include the discriptions of chemical drugs, but of vegetable drugs as well, whenever the description is based on a chemical characteristic.

This explains in part the very liberal use made of structural chemical formulas. The other reason for the use of such formulas is to be found in the polyglot character of the Swiss pharmacist. The Swiss Pharmacopœia was published simultaneously in German, French and Italian. With the exception of a few paragraphs in French and Italian addressed to the French and Italian reader respectively, this commentary is written in German. The language of the chemical formula and equation, however, is not national, but international; it is understood by the French and Italian reader as readily as by the German.

The book is a credit not only to the publisher, but also to the author, the proprietor of the Anglo American Pharmacy of Zürich. It demonstrates once more that genuine scientific and literary work is not incompatible with the everyday duties of a practicing pharmacist. One may earnestly hope that the book will not only prove a source of instruction to the prospective pharmacist and a guide to the master, but a stimulus and even an inspiration to those who are at times discouraged by the general tendency toward commercialization of our calling. *E. K.*

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* The bulletins and annual reports of this station are sent free to all residents of Wisconsin who request it.

Dictionnaire de Physiologie par Charles Richet, Profésseur de Physiologie à la Faculté de Médicine de Paris. Tome Premier, A–B, avec gravures dans le texte. Fascicule 1er pp. XI, 1–336. Ancienne Librairie Germer Baillière et Cie, Paris; Felix Alcan, Éditeur, 1895. 8 fr. 50 centimes.

The first volume of more than a thousand quarto pages covering little more than the letter A has been issued in three fascicles. Fascicle one, covering articles Abasie-Astasie—Aliments lies before us. In the preparation of this monumental work Prof. Richet is assisted by a force of thirty-seven colaborers, specialists in their respective fields.

The reasons for writing so extensive a treatise are briefly summarized by the editor-in-chief as follows: 1. A dictionary of physiology does not exist; 2. the classical treatises on physiology are too short and too old; 3. these classical treatises, however perfect they may be, can never supplant a dictionary.

These reasons are well supported by illustrations. Yet, however important and true these reasons may be, the authors felt morally justified in their undertaking by holding clearly in view the fact, that physiology, in order to be complete, should step out of its too narrow limits and invade those domains which to it were otherwise forbidden. Physics, bacteriology, medicine, chemistry, therapeutics, physiology ought to be treated in their main parts from a physiological point of view. Thus, e. g. the article cocaine will be found in medical and other dictionaries and hand-books. But it is not the physician's or surgeon's view of the subject, however exhaustive, nor the chemist's nor the pharmacognosist's primarily, which the physiologist desires. He wants in compact form the results of all investigations on the physiological effect of this drug upon the animal system and only such other information on the subject as will lead to a better understanding of his branch.

Again, bacteriology, though largely physiological, as a separate science includes much in which the physiological specialist is but little interested. Questions of identity, methods of cultivation, the special habits or size of bacteria are not in the programme of the physiologist. But he may not ignore the phenomena of infection, of incubation, of vaccination, of attenuation, of antisepsis.

Chemistry and physiology are so closely united that one might conceive the latter as a chapter of the former. It is therefore but natural that chemistry occupies a very important place in this dictionary.

A noteworthy feature of this dictionary is the importance given to history and bibliography, two extremely important subjects ofttimes largely, or even entirely neglected in text-books of physiology.

It is evident that this dictionary addresses itself above all to physiologists. No doubt all physiologists, whether of France or foreign countries, will more or less find themselves compelled to take cognizance of this work and to consult the same. The ideal of the authors, however, is still higher. It is expected that physicians, chemists, physiologists, naturalists and we may add intelligent pharmacists, who ofttimes have no easy access to larger physiological treatises and even less to original memoirs, will find this dictionary convenient and wellnigh indispensable. Physiology is a border science between medicine and pharmacy and it is just as important for the latter to be informed on physiological subjects as it is for the former. The truth of this statement will find exemplification in the reviews of the fascicles as they appear from time to time.

Of the seventy articles contained in the first fascicle several are veritable monographs. The last article, which is continued in the second fascicle, namely that on foodstuffs (Aliments) written by L. Lapicque and Charles Richet covers 88 pages. It is full of interesting information not only to the physiologist or scientist, but to the educated general reader as well. Other longer articles of more or less general interest are those on the alcohols (29 pages), on albuminoids (28 pages) and acclimatation (7 pages). There are a large number of articles of special interest to the pharmacist and chemist, notable among these an 18 page article on alkaloids with an interesting chapter on the history of the same. As many as 25 articles are on distinctively chemical subjects. A smaller number bear on vegetable and animal drugs. An article in which botany is very conspicuous is that on algae, covering 31 pages. Articles of distinctively physical bearing are those on accomodation (39 pages).

This may suffice to give the reader an idea of the general scope of the work. As will readily be seen, almost all collateral sciences are called into use and that which is of physiologic interest is emphasized. The result is that not only physiological specialists, but men of almost all sciences, who desire information on the physiological aspect of their science, will find this work of great and valuable assistance. Nothing more than a general outline can be given at present. In reviewing some of the other fascicles attention will be called to some of the more important details. The work is a credit to both authors and publisher.

E. K.

Pharmaceutischer Kalender, 1896. Mit Notizkalender zum täglichen Gebrauch nebst Hilfsmitteln für die pharmaceutische Praxis. Herausgegeben von Dr. H. Böttger und Dr. B. Fischer. In zwei Theilen. Fünfundzwanzigster Jahrgang. Verlag von Julius Springer, Berlin, 1896.

Although repeated attempts have been made in this country to publish pharmaceutical calendars, none has ever gained foothold. In Germany, calendars are yearly written for almost all trades and professions. The Pharmaceutische Kalender, 1896, lies before us in its 25th edition. It is the 36th edition of the Pharmaceutischer Kalender für Norddeutschland. It is printed in two parts.

Part I. contains information with regard to postal and telegraph rates, a railroad map of the German Empire, astronomical calendar, a pharmaceutical calendar for collecting medicinal plants etc., and a diary. Specific information is given under two headings: a. *Hilfsmittel für die Officin*; b. *Hilfsmittel für das Laboratorium*. Under the first heading are enumerated rules for compounding prescriptions, tables of maximum doses, abbreviations and symbols used on prescriptions, tables of solubility and saturation, poisons and their antidotes, incompatibilities, tables of weights and measures etc. Under the second heading are found tables of atomic weights of the elements, of molecular weights and compositions of the more commonly used chemical preparations, tables of specific gravity and percentage strength of acids and other aqueous solutions, also of alcohol etc.

Part II. constitutes a condensed pharmaceutical year book. The leading article is by Dr. Fischer on serum-therapy. This is followed by a codex of laws pertaining to pharmacy in the various states of the Empire, the names of the members of the various examining boards etc., a directory of the pharmacists of the German Empire, a catalogue of chemical, pharmaceutical and botanical literature that has appeared during the past year and a classified catalogue of firms dealing in pharmaceutical supplies.

Part I. is particulary useful for ready reference behind the prescription counter and in the laboratory. Part II. for similar use at the office desk.

E. K.

Erläuterungen zur qualitativen Analyse anorganischer Körper. Von Dr. Alexander Spraul. pp. XII, 173. C. W. Kreidel's Verlag, Wiesbaden. 1896.

As stated in the preface, this book is intended to serve as an explanatory supplement to the tables and short treatises used for the instruction of beginners in practical laboratory work, and at the same time to prepare the student by the necessary theoretical instruction for the more advantageous use of the extensive details of larger works.

In pursuance of this plan, the author has very successfully embodied in his work a description of chemical apparatus and the mode of its employment, illustrated by a number of wood cuts, followed by chapters on reagents, reactions of elements and compounds and on the methodical course of examination. The subject is treated in such a way, as to lead the student, not only to become acquainted with the facts, but also to understand the reasons for the successive steps taken to accomplish the work, and to draw his attention to the important characteristics of the phenomena to be observed. But while the book is mainly intended to serve as an intermediate between the first and more advanced instruction, it will also serve as sole text-book for those, whose business demands a lower limit of acquaintance with chemical analysis and who do not wish to go to the expense of a multiplicity of books. For it is far above the brief epitome of a science primer, while it avoids the bulky accumulation of special information found in the larger manuals.

Charles O. Curtman.

Vierteljahresschrift über die Fortschritte auf dem Gebiete der Chemie der Nahrungs- und Genussmittel, der Gebrauchsgegenstände sowie der hierher gehörenden Industriezweige. Redigirt von Dr. A. Hilger. Zehnter Jahrgang. Das Jahr 1895. Drittes Heft. pp. 321—483. Verlag von Julius Springer, Berlin. 1895.

In editing this quarterly Dr. Hilger is assisted by sixteen colleagues, who are connected with universities, agricultural experiment stations and sanitary bureaus in Germany and Austria. The object of this quarterly is to bring within easy reach of the analytical or sanitary chemist all such information pertaining to his domain as is constantly being published in a host of journals and a number of different languages. The names on the title page sufficiently vouchsafe for the accuracy and thoroughness with which this work of compilation is accomplished.

In as much as this work has heretofore been reviewed in the German language in the columns of the Rundschau, it may not be out of place to give a list of the chapters under which the numerous articles are abstracted: Meat (p. 321), Peptones and Meat Preparations (p. 327), Milk (p. 322), Cheese (p. 347), Butter (p. 349), Fats (p. 353), Spices (p. 358), Tea (p. 360), Coffee (p. 361), Cocoa and Chocolate (p. 363), Cane and Invert-sugar (p. 363), Glucose (p. 366), Other Sugars (p. 368), Fermentation (p. 372), Wines (p. 397), Beer (p. 414), Alcohol (p. 420), Vinegar (p. 431), Starch, Flour and Bread (p. 431), Water, Water-supply, Mineralwaters, Wastewaters (p. 437), Preserves and Preservatives (p. 449), Analytical Methods and Apparatus (p. 457), Laws, Ordinances and Court decisions (p. 465), Activity and Laboratories (p. 477), and Literature (p. 482).

The pages were added in the above list to indicate somewhat the amount of information given in each chapter. Not only do their quarterlies supply the busy chemist with new facts and methods, but the complete volumes are storehouses of valuable information. The abstracts are supplied with references, so that such chemists, as have good library facilities, can in many instances at least refer to the original articles for detailed information.

E. K.

Meyers Konversations-Lexikon, Band X.

Was man heute zu den unleugbaren Vorzügen eines Konversations-Lexikons auch rechnen mag, passt vor allem auf Meyers Konversations-Lexikon. Hinsichtlich der Vollständigkeit und Klarheit der Darstellung, der bewundernswerthen Durchführung des Bearbeitungsplanes, wie endlich des Reichthums und der Vortrefflichkeit des Bilderschmucks hat dieses Werk nicht seinesgleichen. Die Zahl und Tüchtigkeit der Mitarbeiter, die unermüdlichen Bestrebungen des Verlags, alles was die hochentwickelte Technik unsrer Zeit an Fortschritten zeitigt, für die Ausstattung des Werkes zu verwenden, verbürgen eben den vollsten Erfolg.

Eine objektive Prüfung des neu erschienenen zehnten Bandes bestätigt unsre Vorausschickung in allen Einzelheiten. Auf 1060 Seiten Text, mit Unterstützung von etwa 360 Textbildern und einer reichen Anzahl von Plänen, Karten und Bildertafeln, bringt auch dieser Band innerhalb der Stichworte: "Kaustik bis Langenau" eine Fülle zeitgemässen praktischen Wissens zur Darstellung. Seinen Inhalt kennzeichnen eine Anzahl wichtiger Beiträge von aktuellem Interesse, als "Kommunismus", "Krankenkassen" (mit umfassender Statistik), "Kredit", "Kolonien" (mit Karten), "Konsulatswesen"; ferner aus dem Gebiet der Rechtswissenschaft die umfassenden Arbeiten über Kriminalität (mit Karte), Krimnalstatistik, als Ergebnis einer auf tiefwissenschaftlicher Grundlage ruhenden Erkenntnis der Verbrechen und ihrer Ursache. Gründlich gehalten und mit lichtvoller Klarheit geschrieben sind die Artikel "Kirche", Kirchenpolitik". Der Geschichtswissenschaft ist ein ganz neuer Artikel über Koalitionskriege

gewidmet. Die Arbeit hat neben ihrem wissenschaftlichen Gehalt noch insofern weitergehende Bedeutung, als sie in der vorliegenden Form ganz neu im "Meyer" erscheint und das verstreute historische Material zu einem Ganzen in übersichtlicher Darstellung vereinigt. Die geographisch-geschichtlichen Artikel "Kolumbien", "Kongo", "Kongostaat", "Kordilleren", "Korea" glänzen auch in dem neuen Band durch musterhafte Bearbeitung und weise Beschränkung des gewaltigen Stoffes auf den Kern des absolut Wissenswerthen. Als eine hervorragende lexikographische Leistung erweist sich der Artikel "Landkarten" mit instruktiver Beilage" Landkartendarstellung". Neben dieser Artikelreihe kommt die Landwirthschaft zu ihrem Recht, die sich sowohl unter ihrem Stichwort als auch unter den sich an das letztere anschliessenden Zusammensetzungen einer ausgezeichneten Darstellung durch eine Autorität ersten Ranges erfreut. Zahlreich vertreten sind auch die hygienischen und medizinischen Themata, die in den Beiträgen über Kind, Kinderernährung, Kinderheilstätten, Kleidung, Kost, Kriegssanitätswesen (mit 2 Tafeln), Krankenpflege, Krankheitsverbreitung in Deutschland (mit statistischer Karte), Fragen von einschneidendstem öffentlichen Interesse in vollster Wissenschaftlichkeit und doch gemeinverständlich erörtern. Die Bearbeitung der kunstgewerblichen und technischen Artikel ist im "Meyer" von jeher die denkbar beste gewesen. Es genügt daher, darauf hinzuweisen, dass auch die Arbeiten über Keramik (mit instruktiver farbiger Tafel), Kunstwissenschaft, Kupferstecherkunst, Kleinkraftmaschinen, Kochherde und Kochmaschinen (mit neuer reichhaltiger Tafel), Kühlapparate, Lampen (mit Tafel) etc., bis zu dem neuesten Stand fortgeführt sind.

Unbedingte Anerkennung verdient ohne Zweifel der Bilderschmuck des neuen "Meyer". Ist es im allgemeinen zeitgemäss, nicht bloss der Pädagogik, dem Wort durch das Bild, der abstrakten Darstellung durch Anschauungsmaterial zur Hilfe zu kommen, so hat Meyers Konversations-Lexikon nun noch in die bildliche Darstellung überall da, wo es thunlich erschien, das Prinzip der historischen Entwickelung hineingetragen und ist damit bestrebt, durch Versinnbildlichen des Werdeprozesses der dargestellten Dinge nach grossen Gesichtspunkten deren heutiges Sein erst ganz verstehen zu lehren und lange texliche Erörterungen überflüssig zu machen. Fast über jedes Bild des Meyerschen Konversations-Lexikons wäre etwas Neues und Gutes zu sagen, doch wollen wir uns begnügen, aus dem Bilderschatz des zehnten Bandes ausser den oben angeführten Illustrationen noch der Sondertafeln in Farbendruck "Kirschen", "unterseeische Korallenlandschaft", "Kostüme", "Landsknechte" und der kartographischen Beigaben "Karte vom Kielerhafen", "Kleinasien" (neu) als wirkliche Meisterwerke der heutigen Illustrationstechnik lobend zu gedenken. *F. H.*

Outlines of Materia Medica and Pharmacology. A text-book for students. By H. M. Bracken, M. D. Professor of Materia Medica, Therapeutics and Clinical Medicine, University of Minnesota. One volume, pp. 383. Publ. by P. Blakiston, Son & Co., Philadelphia. 1895. $2.75.

"This book is the outgrowth of work arranged in 1893 for medical students at the University of Minnesota, under the title of "Outlines of Materia Medica.'. It is intended that it shall serve the purpose of a text-book, for use in the study of materia medica; to facilitate note-taking in the lecture-room; and to aid in the laboratory study of drugs."

TABLE OF CONTENTS.

I. Introduction.
II. The Acids.
III. The Metals.
IV. The Non-metallic elements.
V. The Carbon Compounds.
VI. The Animal Kingdom.
VII. The Vegetable Kingdom.

Part I. or the Introduction contains miscellaneous information. To some of it chemists and pharmacists will, however, have to take exception. That mixtures "are properly speaking emulsions," (p. 20) certainly would require a stretching of the pharmacist's imagination. Glucosides are defined as substances, which decompose "into glucose and a second substance which is different in each instance," (p. 23.) How about glucosides yielding rhamnose (see Victor Meyer) or other sugars. Besides "the other substance" apparently may be the same after all (see p. 234.) "Volatile oils are obtained by distilling over ***a certain volatile principle*** (italics the writers) from vegetable products" (p. 21.) From peppermint oil about 15 different chemical substances have been isolated and yet the chemistry of this oil has not been exhausted.

The definition of capsules as being "small, elongated boxes with rounded ends" certainly might be improved. That they are used for administering drugs "in powder form" is no doubt true, but how about the administration of liquids in capsules? Many of the errors in spelling are no doubt to be attributed to the printer and indicate lax proof reading as eg. formulaes (p. 9), Na_2CH_5O (p. 59), sulphite for sulphide (p. 82), SbO_{23} (p. 112); but the spelling of the terms *aconitum radix* (p. 13) *belladonna folia*, (p. 14) rather indicates carelessness in copying if nothing more.

Parts II, III, IV and V. treat of chemical drugs. If a system of classification has been followed it certainly does not become apparent. Citric, tartaric and lactic acids are grouped with the inorganic acids, salicylic acid with the carbon compounds. Phosphorus is placed among the metals.

If the worlds supply of potassium and its salts depended upon plant ash (p. 44), farmers certainly would not use much potassium chloride for artificial fertilization. How zinc blende or calamine are converted into zinc oxide by "washing" (p. 78) certainly is a problem not yet solved by chemists. The statement that potassium permanganate "is obtained by combining potassa, manganese dioxide, potassium chlorate, diluted sulphuric acid and water" (p. 132) would certainly not pass a chemical student. The pharmaceutical student would immediately pronounce such a formula as a striking example of chemical incompatability.

In writing Part V. the author seems to have defied all principles of classification.

In as much as the book before us is so very largely made up of chemical matter, the writer, a chemist and not a pharmacologist, may be pardoned for having taken the liberty to review a work on materia medica. If the book as a whole were a great improvement on other works one might overlook any number of misprints, misstatements and incomplete statements. If the bibliography on p. 6, is fairly complete, the author appears to have obtained his information chiefly third hand. Not a single German work is mentioned. Indeed the author appears not to have known of some of the most valuable work done in systematic pharmacology in recent years.

The book work, which is neat and attractive, therefore appears in more favorable light than much of the contents at least when viewed from a chemist's point of view. The author should, however, be commended for conciseness, which is not a general characteristic of medical writers. *E. K.*

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EDITORIAL.

Educational Qualification of Chemists.

Only a few years ago German chemists received no official recognition from the German government. Any person who could manipulate a test-tube and a reagent had the right to call himself a chemist and offer his services to a more or less credulous public. The title chemist was not an official title, but could be applied by any person to himself as any dancing teacher or hypnotic trickster in this country has the legitimate right to call himself professor.

The better class of German chemists have for some years advocated a change to the effect that the title of chemist should imply a high-grade technical efficiency. That they have been very successful as far as the *Nahrungsmittelchemiker* or food-chemists are concerned has already been pointed out in the columns of this journal (Vol. 12, p. 275). By way of general preparation such chemists must have completed the gymnasium or a school offering an equivalent course. They must have spent six semesters at a university or polytechnicum and pass an examination before one of the examining boards appointed by the government. That these examinations are no farce may be judged from the character of the membership of such examining boards. They are mostly composed of experts, professors of universities and polytechnicums. By way of illustration the composition of one of these may here be given.

The commission to conduct the *Vorprüfung* or primary examination at Bonn consists of the following members:

Chairman: Dr. Gandtner, curator of the University.

Examiners: Dr. Kekulé, professor of chemistry; Dr. Klinger, assistant professor of chemistry; Dr. Strassburger, professor of botany; Dr. Kayser, professor of physics.

The commission to conduct the *Hauptprüfung* or final technical examination at the same place consists of the following members:

Chairman: Dr. Unger, professor of medicine.

Examiners: Dr. Stutzer, director of the agricultural experiment station; Dr. Auschütz, assistant professor of chemistry; Dr. Schimper, assistant professor of botany.

The technical chemists now desire similar recognition. Their title has been misused even more than that of the food-chemists. Since the latter have received official recognition, the former feel all the more that, as far as public and official recognition is concerned, they now more than ever have been relegated to a back seat. The German Society for Applied Chemistry therefore elected a commission last year at Frankfurt, which was to propose a plan for the examination of chemists in general. This commission, consisting of Dr. C. Duisberg of Elberfeld, Prof. F. Fischer of Göttingen, Dr. Hintz of Wiesbaden, Prof. Ruedorff of Berlin, Dr. Scheuer of Hanover and Prof. Wislicenus of Leipzig, met in November last and prepared the following schedule of requirements for the examination of technical chemists.

Upon application for examination the candidate must present the following:

1. The graduation certificate from a German gymnasium, *Real gymnasium*, or an *Ober-Realschule* with nine classes or an industrial school offering an equivalent course.

2. The certificate of two years' attendance at a university or technical high-school* when making application for the *Vorprüfung* or primary examination; and of four years' attendance when making application for the final examination, or *Hauptprüfung*.

I. *Vorprüfung*.

Toward the close of the fourth semester the primary examination can take place. A qualitative and a quantitative examination must be carried out in the laboratory of the university or technical high-school. This is followed by an oral examination in inorganic chemistry, analytical chemistry, physics, mineralogy and crystallography; and in either botany and zoology or the elements of machine construction and the construction of buildings.

II. *Hauptprüfung*.

After four more semesters of study, the applicant must present certificates to the effect that he has had six semesters of practical instruction in chemical laboratories at a university or technical high-school. The examination comprises:

1. Dissertation on experimental chemical research performed by the candidate. This must be signed by the academic teacher, certifying that it is the work of the candidate.

2. Oral examination in general inorganic chemistry, organic chemistry, physical chemistry, including electro-chemistry, technical chemistry, principles of political economy and of laws pertaining to factories, accidents, and patents, as far as they concern chemical industry.

The proposition was sent to the members of the society, and 339 are reported thus far as having replied to the request for an expression of opinion. Of this number 177 reported favorably without any change, 90 proposed slight changes, 69 greater changes, and only 3 considered such an examination superfluous.

It is but natural that German pharmacists who see the salvation of their calling in similar educational requirements are watching the success of their chemical brethren with an envious eye. In fact, of the 145 persons, who in 1895 have received the certificate as *Nahrungsmittelchemiker*, 63 are such apothecaries, who surpassed the legal requirements for the title "Apotheker" sufficiently to enable them to take the examination as food chemists. It is now being argued that if it is necessary for the public to demand a higher educational qualification of the food chemist, it certainly becomes apparent that the pharmacist should be equally well prepared for his calling. Whereas, formerly pharmacists thought that in the appointment of apothecaries as food-chemists, they might find new channels of legitimate employment, and thus give new lustre to their calling, voices are now being heard more and more which claim that each of these callings demand its man. In fact, some have expressed the fear that the title of *Nahrungsmittelchemiker* being more honored, on account of the higher educational qualification demanded, than that of *Apotheker*, many of the best educated pharmacists will avail themselves of their better education and leave their former profession.

Whereas, those pharmacists who for years have labored apparently in vain to bring about similar educational reforms in their own ranks, may rightly envy their successful brethren, the success of the food chemists and the fair prospects of the technical chemist will no doubt incite them to greater activity still, and will possibly open the eyes of the government, and of those in their own ranks who have persistently opposed such changes. That which is of particular interest to American pharmacists, is the conservatism of their German pharmaceutical brethren and the freedom from traditional requirements which permits the chemists of the same country to act in harmony with present-day educational ideas.

The apprenticeship finds no place in the educational course of the food-chemist or of the technical chemist. Graduation from a gymnasium or its equivalent, i. e., that general preparation which is the *sine qua non* of all learned professions in Germany, is demanded as a foundation on which to build the general scientific and later the more technical training.

At one of the meetings of the Society for Applied Chemistry, Dr. Duisberg, scientific director of the *Farbenfabrik* at Elberfeld, spoke emphatically against the taking of apprentices. He even did not want the prospective chemist to specialize with regard to any particular branch of chemistry at the university or at the polytechnicum. Of the ninety chemists under his charge at Elberfeld, those were not the best who had studied the chemistry of dye stuffs at the technical schools, but those who had laid a broad foundation. He further states that it is remarkable how readily those who have laid a broad scientific foundation will work themselves into any special department into which they may be placed.

A few years ago Prof. Ostwald, (Rundschau 13, p. 134), in a lecture delivered before the Association of German Electricians, explained why it was that English chemical industry was going backward, comparatively speaking, and why the same in Germany apparently was monopolizing the markets of the world. The ninety chemists at the *Farbenfabrik* in Elberfeld and hundreds of others in the chemical factories of Germany with their thorough general preparation and their university training are the secret of the marvelous success of this branch of industry.

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* In Germany the term *Hochschule*, or high-school, is not applied to secondary schools, as is the case in this country, but to the universities and polytechnicums.

The English are recognizing this fact more and more. Not only are English scientists pleading for a change, but even the larger daily papers are demanding it from the government. A higher and broader education for technical men is not a fancy of university professors, but the demand of the hour. The lack of this is costing England millions every year, and now that England has recognized her shortcoming in this direction these millions will, no doubt, speak louder and more eloquently than the humble visionist in the university laboratory.

Will pharmacists in general, will the American pharmacist sooner or later learn the same lesson? The history of pharmacy is no doubt a very interesting chapter of the history of civilization and no true pharmacist would part with it, even if it were the price to be paid for his professional salvation. But the law of evolution demands no such price. We may continue to revel in the past, yet we need not become the slaves of tradition any more than of the almighty dollar. That which has so largely made the *Farbenfabriken* and other chemical factories in Germany, and the lack of which has assisted in unmaking chemical industry in England, will be the making of professional pharmacy in America. Druggists all over the country are complaining bitterly because they are taxed so severely by these *Farbenfabriken* of Germany. Our government even protects these very *Raubritter* beyond the sea by copyrighting the names of their pharmaceutical chemicals. American pharmaceutical manufacturers have demonstrated that they can outstrip any people in the manufacture of galenical preparations. All of the large pharmaceutical manufacturing establishments, in recent years at least, are employing scientific chemists. To our disgrace it must be said that many of them are not Americans but Germans. The Ph. D. of Germany is as much sought by the American chemical and pharmaceutical manufacturers as by the English. These firms are not paying large salaries for a mere ornament. Americans can and in the course of time no doubt will manufacture their own chemicals as well as their own galenicals. But America, can no more compete with Germany than could England, unless she employs the same methods. American manufacturers have already recognized this fact. The practicing pharmacist cannot, like the manufacturer, employ scientific help of a high order, but he can achieve the same or even a better result by the higher education of his own ranks. Herein lies his salvation.

E. K.

ORIGINAL CONTRIBUTIONS.

Medicinal Plants of Brazil.*

By *Dr. Theodor Peckolt of Rio de Janeiro.*

Nyctaginaceæ.

Mirabilis Jalapa L. In den Tropen bis zur Aequatorialzone. Bekannt als *Jalapa do mato* — wilde Jalappe; *Jalapa comprida* — lange Jalappe; *Purga de nabico* — Rübenpurgans.

Stengel aufrecht, gabelästig, bis einen Meter hoch; Blätter glatt, gegenständig, oval-herzförmig, zugespitzt; Blüthen purpurfarben, trichterig; Frucht oval, liegt im Kelche, von der Grösse einer grossen Erbse.

Die fleischige, langspindelförmige Wurzel ist aussen braun, im Durchschnitt gelb. Im frischen Zustande ist sie von unangenehmem Geruch und ekelerregendem Geschmack. Dieselbe wird in Scheiben geschnitten und auf Bindfaden gereiht an der Sonne getrocknet.

Mirabilis Jalapa L. In the tropical regions as far as the equator. Known as *Jalapa do mato* — wild jalap; *Jalapa comprida* — long jalap; *Purga de nabico* — "Ruebenpurgans."

Stem erect, forkedly-branched, reaching a meter in height; leaves smooth, opposite, oval-cordate, acuminate; flowers purple, funnel-form; fruit oval, enclosed in the calyx, in size equal to a large pea.

The fleshy, long-fusiform root is brown externally, in section yellow. When fresh it possesses an unpleasant odor and a nauseating taste. It is cut into discs, which are strung on twine and dried in the sun.

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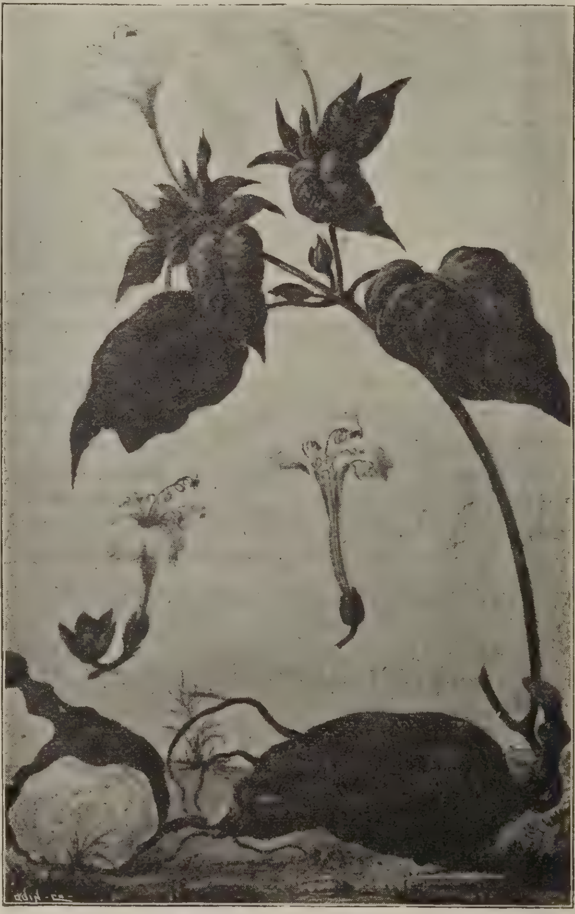
*Continued from vol. 13, p. 237. Translated for the Review by Dr. *R. H. True*, instructor in pharmacognosy at the University of Wisconsin.

Comparatively little is known about the medicinal plants of Brazil, so that any and all information concerning the same is of interest to pharmaceutical students everywhere. German journals and the compiler of the German pharmaceutical *Jahresbericht* have, therefore, made liberal use of the articles from the pen of Dr. Peckolt that have appeared in the earlier volumes of the Review. For this reason it was thought best to give the original German side by side with the English translation. If the English version were to be retranslated into German the manuscript would certainly suffer more or less from a double translation. [Editor Review.]

Das Pulver, in der Dosis von 2 bis 4 Grammen als Abführmittel gegeben, verursacht stets Leibschmerzen. Bei Sumpffiebern wird vom Volke erst dies Abführmittel genommen, dann Chinin. Das Stärkemehl wird vom Volke als Laxans für Kinder benutzt.

Nach Manso soll das hier im Handel befindliche *Resina de batatas*, welches als Ersatz von Jalapenharz dient, aus dieser Wurzel bereitet werden. Dasselbe wird von Pernambuco und Bahia aus in den Handel gebracht. Durch den Reisenden des hiesigen Museums, Herrn Schreiner, erhielt ich ein Herbariumexemplar der Pflanze aus dessen Wurzel das Harz bereitet wird. Dieses jedoch war nicht *Mirabilis Jalapa L.*, sondern *Operculina convolvulus*, der Familie *Convolvulaceæ* zugehörend.



Mirabilis dichotoma L.

Mirabilis dichotoma L. Heimisch in Mexico und Guiana, wahrscheinlich auch in den hiesigen Nord-Staaten. Hat sich in allen Staaten verbreitet und verwildert. In allen Gärten, an den Wegen der Landstrassen, auf den Höhen des Orgelgebirges zeigt die ursprünglich rothe Blüthe alle Farbennuancen: roth, weiss, gelb; roth und weiss gefleckt. Bei Sonnenschein sind die Blüthen geschlossen. Kurz vor Sonnenuntergang öffnen sich dieselben und verbreiten einen Wohlgeruch, welcher dem einer Mischung von Jasmin und Reseda ähnlich ist. Als Volksnamen sind zu erwähnen: *Bellas noites* — schöne Nächte; *Bon noite* — gute Nacht; *Bonina* — Tausendschön; *Maravilha* — Wunderblume.

Der aufrechte, gabelästige, knotige Stengel ist dicker und niedriger als bei der Vorhergehenden. Die Blätter sind kleiner, oval, etwas zugespitzt, an der Basis abgestumpft. Die Blüthen sind fast sitzend, trichterig. Der runde Samenkern hat die Grösse einer kleinen Büchsenkugel. Die Samenschale ist schwarz und runzelig. Unter der Samenschale befindet sich eine harte hellbräunliche Pelicula, welche den Kern umgiebt. Dieser ist mit schneeweissem fast trockenem Stärkemehl gefüllt. Das Embryo befindet sich an der einen Seite, welche durch eine Rinne markirt ist.

Ein frischer Same wog im Mittel 0.150 Gramm und enthielt 0.038 Gramm Stärkemehl. In 100 Gramm frischen, entschälten Samen sind enthalten: Stärkemehl 18.733 p. c., weissgelbliches Fett von Butterconsistenz 0.4 p. c., bräunliche Harzsäure 0.333 p. c.

Die Mädchen bereiten das Stärkemehl, vermischen dasselbe mit Citronensaft zu einer weichen Masse und bestreichen damit die Sommersprossen.

The powder, given as a purgative in a dose of from 2 to 4 grams, always causes abdominal pains. In swamp-fever, among the people, this purgative is first taken, then quinine. The starch is used by the people as a laxative for children.

According to Manso the *Resina de batatas*, here found on the market as a substitute for jalap resin, is prepared from this root and comes from Pernambuco and Bahia. Through the traveling agent of the local museum, Mr. Schreiner, I obtained an herbarium specimen of the plant from the root of which the resin is prepared. It is not *Mirabilis Jalapa L.*, but *Operculina convolvulus* of the family *Convolvulaceæ*.

Mirabilis dichotoma L. Native in Mexico and Guiana, probbably also in the northern Brazilian states, this plant has become wild and has spread throughout the country. One finds it in all gardens, at the roadsides, and on the heights of the Organ Mts. The flowers, which were originally red, show all shades of color: red, white and yellow; or spotted red and white. In sunshine the flowers remain closed. Shortly before sunset they open, giving off a pleasant fragrance which resembles that of a mixture of jasmine and mignonette. It is known by the following common names: *Bellas noites* — beautiful night; *Bon noite* — good night; *Bonina* — "Tausendschoen"; *Maravilha* — wonderflower.

The upright, forked, jointed stem is thicker and lower than in the preceding. The leaves are smaller, ovate, somewhat acuminate, and blunt at the base. The flowers are almost sessile, funnelform. The round seed is of the size of a small bullet. The outer seed-covering is black and wrinkled. Beneath this is found a hard, light-brown pellicle, which surrounds the kernel. This is full of almost dry, snow-white starch. The side where the embryo is found is marked by a groove.

A fresh seed weighed on the average 0.150 gram and contained 0.038 gram starch. From 100 grams of fresh seeds, deprived of their seed coats, there was obtained: 18.733 p. c. starch, 0.4 p. c. of a yellowish fat of butyraceous consistence, and 0.333 p. c. of a brownish resin acid.

The girls prepare the starch, mix it with lemon juice to form a soft mass, which they use to rub on freckles.

Die Wurzelknollen sind schwarz, Rettig ähnlich nur länger, mit kleinen Mohrrübenförmigen Ausläufern. Im Durchschnitt sind dieselben weiss, sich an der Luft röthend.

In 1000 Gramm frischen Knollen wurden gefunden:

Wasser	833.000
Fettsäure	1.223
Weichharz	0.577
α–Harzsäure	0.110
β–Harzsäure	3.555
Eiweissstoffe	2.300
Stärkemehl	30.000
Zuckerhaltiger Extractivstoff	15.000
Extractum aquosum	10.000
Asche	17.000

Die krystallinische Fettsäure ist strohfarben, geruchlos und von schwach ranzigem Geschmack. Mit Schwefelsäure färbt sich dieselbe rothbraun. In kleinen Dosen wirkt sie nicht abführend.

Das Weichharz ist fahlgelb, von Terpentinconsistenz, ist geruchlos und besitzt einen ekelerregenden Nachgeschmack. Es verbrennt mit lebhafter Flamme ohne Rückstand. Mit Schwefelsäure färbt es sich purpurroth, dann blutroth, während die Säure selbst farblos bleibt. Es löst sich nur in Aether, Chloroform, Amylalcohol und absoluten Alkohol. In Dosen bis zu 0.4 Gramm verabreicht bewirkte es keinen Stuhlgang.

Die α–Harzsäure ist hellgelb, stark klebend, geruchlos und von unangenehmem, schwach bitterem Nachgeschmack. Dieselbe verbrennt mit lebhafter Flamme ohne Rückstand. In Schwefelsäure löst sie sich mit rothbrauner Farbe. Dieselbe ist löslich in Petroläther, Benzol, Chloroform, Aether, Alkohol und Ammoniak.

Die β–Harzsäure is fest, dunkelbraun, geruchlos und von unangenehmem Nachgeschmack. Dieselbe verbrennt mit lebhafter Flamme und eigenthümlichem nicht unangenehmem Geruch ohne Rückstand. Mit Schwefelsäure färbt sie sich rothbraun. Sie löst sich in Chloroform, Eisessig, Alkohol und Alkalien.

Eine Dosis von 0.8 Gramm bewirkte erst nach drei Stunden mehrfaches Purgiren mit Leibschmerzen. Die Aerzte verordnen das spirituose Extract in der Dosis von 1 Gramm, das Wurzelpulver in Dosen von 3 bis 6 Grammen bei Wassersucht, Leucorrhea und herpetischen Ausschlägen. Ein Decoct von 8 Gramm Wurzel zu 360 Gramm Colatur, während des Tages in drei Portionen getrunken, wurde neuerdings als heilkräftig bei Diabetes gerühmt. Nach meinen Beobachtungen wurde am zweiten Tage schon bedeutend weniger urinirt. Am vierten Tage war kein Zucker mehr nachweissbar. Nach dem achten Tage konnte oder wollte der Kranke die unangenehmschmeckende Arznei nicht mehr nehmen. Zwei Tage darauf wurde wieder Zucker im Harn gefunden. Es wäre wünschenswerth, dass von Aerzten ausführliche therapeutische Untersuchungen unternommen würden.

Die frischen, gestossenen Blätter dienen als Umschlag auf Furunkel zur schnellen Eiterung.

Bougainvillea spectabilis Willd. In den tropischen Staaten bis Bahia. Bekannt als: *Roseira do mato*—Waldrose; *Paó de roseira*—Rosenbaum; *Roseta*—Schmuckbaum. Findet die üppigste Entwickelung an den nordwestlichen Abhängen des Orgelgebirges, in den Distrikten der Kalkformation, wo dieser baumartige Strauch in der Blüthezeit einen prachtvollen Anblick darbietet.

The tubers are black, resembling the radish only longer, with small carrot-shaped stolons. In section they are white, becoming red when exposed to the air.

In 1000 grams of the fresh tubers was found:

Water	833.000
Fatty acid	1.223
Soft resin	0.577
α–Resin acid	0.110
β–Resin acid	3.555
Proteids,	2.300
Starch	30.000
Sugar-containing extract	15.000
Aqueous extract	10.000
Ash	17.000

The crystalline fatty acid is straw-colored, odorless and of a slightly rank taste. With sulphuric acid it becomes reddish-brown. In small doses it does not act as a purgative.

The soft resin is pale yellow, of the consistence of turpentine, odorless and possesses a nauseating aftertaste. It burns with a bright flame leaving no residue. Sulphuric acid colors it purple-red, then blood-red, the acid itself remaining colorless. It is soluble only in ether, chloroform, amyl alcohol and absolute alcohol. Administered in doses up to 0.4 gram it produced no passage of the bowels.

The α–resin acid is light yellow, very sticky, odorless and has an unpleasant, slightly bitter aftertaste. It burns with a bright flame without residue. It dissolves in sulphuric acid with a reddish-brown color. It is soluble in petroleum-ether, benzene, chloroform, ether, alcohol and ammonia.

The β–resin acid is solid, dark-brown, odorless and possesses an unpleasant aftertaste. It burns with a bright flame and a peculiar, not unpleasant odor, leaving no residue. Sulphuric acid colors it reddish-brown. It is soluble in chloroform, glacial acetic acid, alcohol and in alkalies.

A dose of 0.8 gram caused after three hours repeated purging with abdominal pains. Physicians prescribe the alcoholic extract in doses of 1 gram, the powdered root in doses of from 3 to 6 grams for dropsy, leucorrhœa and herpetic eruptions. Lately it has been favorably mentioned as a remedy in diabetes. A decoction of 8 grams of the root to 360 grams colature is taken during the day in three portions. According to my own observations the amount of urine passed was considerably diminished on the second day. On the fourth day a reaction for sugar was no longer obtainable. After the eighth day the patient could not or would not take more of the unpleasant-tasting medicine. Two days later sugar was again found in the urine. It would be very desirable if extended therapeutic experiments were made by physicians.

The fresh, bruised leaves are used as an application to carbuncles for rapid suppuration.

Bougainvillea spectabilis Willd. In the tropical states as far as Bahia. It is known as: *Roseira do mato* — wood rose; *Paó de roseira* — rose tree; *Roseta* — ornament tree. It shows the most luxuriant growth on the northwestern slopes of the Organ Mountains, in the district of the limestone formations, where this tree-like shrub at the time of blooming offers a most beautiful sight.

Dieser sowohl als der Folgende werden durch Stecklinge vermehrt, welche hier im Staate Rio nur gedeihen wenn dieselben im Monat August gepflanzt werden. Ich pflanzte in meinem Garten einen Steckling von 32 Centim. Höhe in mit Kalk gedüngtem Boden. Nach drei Jahren hatte derselbe schon vier Meter Höhe und blüthe üppig. Auf den Höhen des Orgelgebirges in Neufreiburg, Petropolis etc. gedeiht derselbe zu einem dickstammigen Baume. In dem Tieflande bildet derselbe stets einen baumartigen Strauch mit abstehenden Aesten. In den Axeln der Zweige befinden sich scharfe, oft 5 Cm. lange Stacheln. Die abwechselnd stehenden kurzgestielten Blätter sind oval, stumpf oder kurz zugespitzt. Der Blüthenstand ist endständig, mit grosser, ästiger Blüthenrispe. Die Blüthen sind mit drei grossen prachtvollgefärbten Hochblättern versehen, welche je nach Standort, auf Kalkboden roseroth, auf Granitboden hell scharlachroth gefärbt sind.

Der medicinische Gebrauch dieser Pflanze ist sehr beschränkt. Dieselbe wird vorzugsweise als Zierbaum in den Gärten angepflanzt. Das Decoct der Wurzelrinde findet Verwendung als harntreibendes und gelindwirkendes Abführmittel; das Decoct der Blätter als Einspritzung bei Leucorrhea; die an Potasche reiche Asche zur Reinigung des Zuckers.

Die beiden folgenden Species werden nicht arzneilich benutzt, doch ebensohäufig zum Schmuck der Gärten kultivirt.

Bougainvillea glabra Choisy bewohnt denselben Bezirk, geht aber im Staate S. Paulo noch jenseits der Tropenzone. Derselbe wird ebenfalls oft baumartig, besitzt roserothe Hochblätter und ist unter dem Volksnamen *Tapirica* bekannt.

Bougainvillea pomacea Choisy. Auf den Ebenen der Tropenzone bis Bahia. Ist stets strauchartig. Blüthenstand in strausartigen Rispen mit ziegelrothen Hochblättern. Volksbenennung: *Tres Marias.*

This, as well as the following plant, are multiplied by cuttings, which here in the state of Rio thrive only when planted in the month of August. I planted a cutting 32 cm. long in soil fertilized with lime. After three years it had already reached a height of four meters and blossomed luxuriantly. On the heights of the Organ Mountains, at Neufreiburg, Petropolis etc. it becomes a thick-stemmed tree. In the lowlands it always forms a tree-like shrub with spreading branches. In the axils of the twigs stand sharp thorns, often 5 cm. long. The alternate, short-petioled leaves are oval, blunt or short acuminate. The inflorescence is a large, terminal, branching panicle. The flowers are provided with three large, showily-colored floral leaves, which according to locality have characteristic colors; in calcareous soil they are bright rose-red, in granitic soils light scarlet-red.

The medicinal use of this plant is very limited. It is planted in gardens mainly as an ornament. The decoction of the root bark is used as a diuretic and mild purgative; the decoction of the leaves as an injection in leucorrhœa. The ash, which is rich in potash, is used in purifying sugar.

The two following species are not used medicinally, but are cultivated as frequently for ornamenting gardens.

Bougainvillea glabra Choisy grows in the regions indicated for the preceding species, but in the state S. Paulo is also found on the other side of the equator. It is likewise often tree-like, has rose-red floral leaves and is commonly known as *Tapirica.*

Bougainvillea pomacea Choisy. Upon the plains of the tropical zone as far as Bahia. It is always shrub-like. The inflorescence is a thyrsoid panicle with brick-red flowers. Popular name: *Tres Marias.*

◆

Asafoetida.[1]

By Prof. *J. U. Lloyd.*

Brief Description of the Drug.

Leading authorities inform us that asafoetida is a gum resin exuding from the roots of the genus *Ferula* of the natural order *Umbelliferae.* The smell so characteristic of the resin is mainly to be found in the following species:—

I. *Ferula Scorodosma* Bentley & Trimen, (Synonyms, *Ferula Asafoetida* Linn., Boissier; *Ferula foetida* Regel.)

II. *Peucedanum Narthex* Baillon.

The drug comes to Europe from southern Persia and Afghanistan, usually via Bombay, and is obtained by making incisions into the roots of the aforenamed plants at a certain time of the year, and collecting the exudation. Inert substances are invariably incorporated with it, in order to give the milky juice a proper consistence and render it convenient for shipment.

The best kind of asafoetida thus obtained is *Asafoetida in granis*, consisting of roundish tears of varying size, sometimes as large as 3 cm., or of flattened pieces, often sticking together. These tears are white at first, but when exposed to light and air, assume a delicate red hue which slowly changes into purple-red and brown. The inner portion remains wax-like and white. With water they form an emulsion, which alkalies turn to an intense yellow.

The common kind, *Asafoetida in massis*, consists of a granular conglomerate in which are imbedded single tears of the better kind; and admixed therewith are inert substances, like clay, calcium carbonate, gypsum, particles of roots and stems.

While it is true, that for the reason mentioned before, the addition of such extraneous matter is justifiable if within moderate limits, it is also well known that in the asafoetida trade these limits are far from being observed, and that for years the addition of foreign matter to asafoetida has been sometimes in enormous proportions. However, recent workers on the asafoetida subject,[2] seem to entertain a more hopeful view of the situation with regard to asafoetida imported for this country; whether this hope is sustained by the results given in this paper, remains a matter of individual opinion.

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[1] Credit is hereby given to Dr. Sigmond Waldbott for detail work and valuable assistance.

[2] See Albert Plaut, Pharmaceutical Era, 1894, p. 517, "Adulteration of drugs in the United States."

Recent Literature on the Examination of Asafoetida.

The principal lines of examination which have been followed thus far in order to establish a standard for purity of asafoetida, and which are also adopted in the present paper, are limited mainly to the determination of the amount of alcohol-soluble matter and of ash left upon incineration of the drug. In recent years, additional methods have been introduced which will be touched upon at the end of this paper.

Both the Pharmacopœia of the United States and the German Pharmacopœia make a certain allowance for the amount of inert matter contained in asafoetida: "At least 60% of it should dissolve in alcohol," U. S. P., 1890. "More than 50% of the drug should be soluble in alcohol," and "100 parts of asafoetida should leave not more than 6 parts of Ash." Germ. Ph., 3rd edition, 1890.

It follows that the German Pharmacopœia makes less strict requirements with regard to soluble matter, but gives some requirements for the amount of ash which the U. S. P. has (wisely?) omitted.

From the literature on hand it seems as though the requirement for alcohol-soluble matter of the U. S. P. is rarely met with, and not at all that of the German Pharmacopœia with regard to the amount of ash. In consequence, the German firm of Gehe & Co. refused to supply the drug.[3]

Flückiger[4] mentions that the juice obtained early in the season seems to contain less resin than that obtained later. One specimen of a lot from Kandahar, very scarce and costly, which he received from a reliable source, yielded only 10.8% resin, but 47.9% gum, while an ordinary selected quality, of later-gathered asafoetida yielded him 71.4% resin. As to ash, he states that one specimen of the purest grains left upon combustion only 3/4% ash, while another good specimen, selected in Bombay for the European market, yielded 8.71% ash. In the following cases we are confronted with asafoetida of very different characters. Fristedt and Th. Mörner[5] examined a curious specimen of asafoetida consisting of 86% of alabaster and only 14% of asafoetida. E. Dieterich[6] experimented on three specimens of crude asafoetida, obtaining the following values:—

	Percent. soluble in alcohol.	Percent. ash.
I.	15.43,	66.0.
II.	18.70,	54.0.
III.	53.60,	15.6.

W. A. Puckner[7] determined the amount of alcohol-soluble matter and of ash in five samples of asafoetida as it was then found in the American wholesale trade. His results as far as they are of interest for our purpose are as follows:—

	Soluble in alcohol.	Total ash.
I, best kind in mass...	59.49%,	19.45%,
II, best kind in mass...	27.39%,	56.03%, ($CaSO_4$, $CaCO_3$).
III, best kind powdered, N. Y..........	44.48%,	38.59%, ($CaSO_4$).
IV, best kind powdered, Chicago....	33.47%,	47.86%,
V, "purified goods," powdered...........	31.35%,	55.38%.

Space does not permit the regarding of earlier researches instituted by Schaer, Maisch, Price, and others.

Present Condition of the Drug.

Recently in attempting to procure asafoetida that would meet the requirements of the U. S. P., representative samples were obtained from different New York importers of unimpeachable integrity. Be it said to their credit, none of the dealers were willing to guarantee it to conform to the U. S. P., indeed the general impression was that commercial asafoetida would not stand the U. S. P. alcohol test. The result illustrates the difficulty these importers labor under when it is seen that of samples from six different parcels, selected for this examination, only one answered the purpose.

In this line of experiments the amount of alcohol-soluble matter was determined by boiling out a weighed quantity of asafoetida repeatedly with an excess of alcohol, drying and weighing the residue. The ash was determined in most cases by incinerating the original sample; in some cases marked by an asterisk (*), the ash was also determined by incinerating the residue left by the alcohol.

The following samples were operated upon:—

Sample A.—Soft mass, conglomerate of small grains; very few large tears present, color first reddish, later gray; visible impurities—Cloth, bristles, wood.

Sample B.—Soft mass. Rather uniform appearance, few large tears imbedded.

Sample C.—Some large tears present of about half the total weight (12 in 25). To all appearance good specimen, remarkably dry.

Sample D.—A mixture of 1 part of pure tears and about 4½ parts of gray mass with some tears imbedded. Dry specimen. Brown color.

Sample E.—In appearance resembles Sample D, the tears are present in the proportion of about 1 in 5.

Sample F.—Somewhat glossy appearance. Small grains, uniform-looking specimen. (Origin, Persia).

Sample G.—Same in character as Sample F.

The results of the examination are given in the following table. In most samples several pieces were examined as shown by the figures affixed to the letters in the first column. The total averages in columns II and IV are calculated on the basis laid down in the preceding description of the specimens.

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[3] Gehe, Handelsbericht, April, 1891.

[4] Pharmacognosie des Pflanzenreiches, 3rd ed. Berlin, 1891.

[5] Pharm. Rundschau, 1889, p. 205, also Jahresb. d. Pharm. 1889, p. 138.

[6] Jahresb. der Pharm., 1891, Vol. 26, p. 11.

[7] Proc. Am. Pharm. Assn., 1890, p. 180, also Western Druggist, 1890, p, 361, and Druggists' Circular, 1890, p. 225. "What amount of sand is present in commercial asafoetida?"

Table I.

Designation of specimens.	Per cent soluble in alcohol.			Per cent insoluble in alcohol.	Per cent ash.	Per cent ash Total average	Prominent inorganic constituents.
		Average.	Total average.				
A. I. a.	37.1		35.6	62.9	44.33 *	49.16	Mostly crystallized gypsum.
b.	34.2			65.8	53.98		
B. I. a.	42.01		37.7	57.89	36.33 *	43.1	Gypsum.
b.	36.6			63.4	43.84 *		
c.	34.7			65.3	49.14		
C. I. a.	71.85	66.77	55.06	28.15	1.78 *	20.5	Gypsum, carbonates.
b.	61.7			38.30	2.47		
II. a.	45.97	46.26		54.03	35.15 *		
b.	52.17			47.83	31.71		
c.	41.02			58.98	39.97		
d.	37.9			62.1			
D. I.	76.3		40.74	23.7	2.55	38.1	Carbonates, gypsum, clay.
II. a.	36.4	32.84		63.6	42.17 *		
b.	29.29			70.71	49.95 *		
E. I.	76.01		44.39	23.99	1.79	34.7	Gypsum, occasionally lumps of stone.
II.	36.49			63.51	42.83		
					42.99		
F. I. a.	65.2		65.9	34.8	16.3	16.3	
b.	66.6			33.4			
G. I. a.	66.15		66.45	33.85	16.19 *	16.19	$CaCO_3$, gypsum.
b.	66.75			33.25			

Discussion of the Table.

With regard to alcohol-soluble matter (column 2), the table shows that of all the specimens examined, only one conformed to the requirements of the U. S. P., viz., sample F, and its check sample G, which was taken from the package ordered on the strength of the result in sample F, showing that the package ran true to sample.

While in samples C, D, and F, there are single tears present which yield to alcohol more than the Pharmacopœia requires (as high as 76% in D, and E), they occur with inferior grades which reduce the average below 60%. However, sample C comes rather near this percentage.

With regard to the alcoholic residues (column 3), they consist both of organic and inorganic matter. The organic substance is a peculiar kind of gum, which on the authority of Flückiger[8] is not very soluble in water. Its presence can easily be demonstrated by the reducing action on Fehling's solution, which may be developed by warming a decanted (turbid) aqueous infusion of the alcoholic residue with a few drops of hydrochloric acid. Especially such samples as C, I, and G, responded to this test very strikingly.

The inorganic substance of the alcoholic residue, as will be seen from the last column (5) has gypsum as a common constituent, this mineral being very abundant in the vicinity of Kandahar where asafoetida is gathered.[9]

Two of the specimens, D and E, also contain silica to an appreciable extent.

Column 4, comprising the ash results, gives an idea as to the quantities of inorganic admixture. The pure tears of C_I, D_I, and E_I, leave very little ash, only 1.78, 2.47, 2.55 and 1.79% respectively. The specimen F has 16.3% and its check sample G left upon incineration of the alcohol residue 16.19% ash. A remarkably high average is exhibited by A, and also in parts of B, D and E. In comparing the values of column 4, with those of column 3, we observe that the loss in weight caused by incineration of the residues varies between 17 and 26%, approximately corresponding to the amount of gum present in the resin.

Purified Asafoetida.

The writer is convinced that the quality of crude asafoetida is beyond the control of drug importers. This view is supported, not only by the returns in America but by the investigations reported in other countries.[10] In connection with this subject we are confronted with the fact that the source of asafoetida is such as to prevent any outside influence from readily changing the methods of collectors. Indeed, it is not at all certain that as the drug must be brought to a mass-like consistence, it is practical to avoid varying proportions of earthy matters that are necessarily added primarily as absorbents. The very nature of the subject leads to the conclusion that the different consistencies of the juice and the

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* For explanation of asteriks see preceeding text.

[8] E. Dieterich; loc. cit.

[9] The Imperial Gazzetteer of India, Vol. 1, p. 37.

[10] loc. cit.

difference in the nature of the absorbents that vary from clay to calcium sulfate, would warrant the belief that while a package of pharmacopœial asafoetida is exceptionally a possibility, and that specimens of tears and fragments now and then nearly pure may be found in all samples, it is impractical for dealers at this period to supply any considerable quantity conforming to the U. S. P. requirements.

And yet, notwithstanding this fact, it is evident that in justice to the medical profession, the variation in commercial asafoetida should be overcome, and the writer favors the introduction of a purified asafoetida, made by abstracting the crude drug with alcohol and evaporating the alcohol. As thus produced the product has the consistence of a thin extract, not thick enough however, to roll into a pill, with an intense odor of asafoetida, and is practically soluble in alcohol. When rubbed with water it produces an emulsion superior to the emulsion that results with the commercial drug.

At first sight it might be supposed that a considerable amount of the volatile oil would be lost in this manipulation, but while a small portion distills with the alcohol, the amount is inconsiderable, at least when compared with the variation that exists in the commercial drug.

It may also be questioned by some persons as to whether the entire virtues of asafoetida are abstracted by alcohol, and yet one who examines the earthy residues will agree that such must be the case. In addition, we have the united testimony of the various pharmacopœias to the effect that the alcoholic test determines its value, as well as does the record of the chief official preparation, the tincture of asafoetida.

In the opinion of the writer it is impractical to obtain a uniform official drug, the only authentic preparation possible is that of purified asafoetida, and in no other direction is the necessity of intelligent supervision over a crude drug more urgent.

Additional substances to investigate.

Mineral matter as an admixture with asafoetida is not the only substance with which dealers have to contend. Even though a specimen will stand the pharmacopœial alcohol test, the asafoetida may be adulterated by the addition of foreign alcohol-soluble resins, a practice which has already come under the observation of the analyst.[11]

In order to detect the presence of such substances as offer no characteristic reactions, systematic investigations have been carried on in recent years with a view to determine certain constant numbers of the pure drug, after the manner in vogue in the analysis of fats and oils, such as the acid, the saponification, the ester and the iodine numbers. It is evident that marked deviations from figures thus obtained are strong indication of foreign admixture of resins.

In this connection we may point to the following literature on this phase of the subject.

A. Kremel, Prüfung der Balsame, Harze und Gummiharze, Jahresb. d. Pharm. 1886, p. 3.

E. Dieterich, Prüfung der Balsame, Harze und Gummiharze, Jahresb. d. Pharm. 1887, p. 16; 1888, p. 8; 1891, p. 11.

H. Beckurts and W. Brüche, Experimentelle Untersuchungen über die Werthbestimmung der Harze und Balsame, Jahresb. d. Pharm. 1892, p. 21.

The addition of rosin or of white turpentine, which substances are those most likely to be fraudulently used as admixtures, may easily be recognized by determining the acid number, represented by the amount of caustic alkali, expressed in milligrams, which neutralizes the free acid contained in 1 gram of pure resin. A few determinations were made with the samples of asafoetida on hand in order to test the feasability of this plan for commercial purposes.

The acid number of white turpentine and of rosin were first sought. Weighed quantities of the resins were dissolved in alcohol and the solution titrated with semi-normal caustic potash, phenolphtalein being used as an indicator.

White Turpentine:—

1) 0.7386 gms. in alcoholic solution consumed 4.06 cc. $\frac{N}{2}$ KOH.
2) 1.8465 gms. in alcoholic solution consumed 10.09 cc. $\frac{N}{2}$ KOH.
3) 3.6930 gms. in alcoholic solution consumed 20.19 cc. $\frac{N}{2}$ KOH.

Acid number calculated: 1) 153.9; 2) 152.9; 3) 153.1; average: 153.3.

Rosin:—

1) 3.2738 gms. in alcoholic solution consumed 19.4 cc. $\frac{N}{2}$ KOH.
2) 8.3138 gms. in alcoholic solution consumed 48.7 cc. $\frac{N}{2}$ KOH.

Acid number calculated: 1) 164.9; 2) 164.15; average: 164.5.

Asafoetida:—

Now as regards the determination of the acid number of asafoetida, a series of five experiments was undertaken. In the first, an alcoholic extract (in the composition of which all samples on hand participated) was evaporated on the water bath as nearly as possible to constant weight, a weighed quantity of the residue (purified asafoetida) taken up with alcohol and the solution titrated with semi-normal caustic potash, phenolphtalein being used as an indicator.[12]

In the four remaining cases, a weighed quantity of crude asafoetida was boiled out with alcohol, the residue weighed and the amount of resin operated upon was determined by difference.

In all cases, however, the acid number was referred to 1 gm. of alcohol-soluble substance, free from gum and mineral matter.

The results are as follows:—

I. Purified Asafoetida. 7.0276 gms. purified asafoetida consumed 7.8 cc. semi-normal caustic potash. Acid number, 31.1. This figure is most probably too low on account of the difficulty of completely expelling, on the water bath, alcohol and moisture from the viscid mass.

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[11] See for example, Th. Waage, Jahresb. d. Pharm. 1893, p. 198. Dr. T. L. A. Greve, of Cincinnati, has met with the commercial drug in which were imbedded large lumps of rosin.

[12] Special experimentation would be required to establish a method to titrate an alcoholic solution of asafoetida with absolute exactness as it is sometimes extremely difficult to define the exact point of neutralization. Fairly good results were obtained, however, when diluting the alcoholic solution with water and observing the point where a red coloration first appears upon dropping a solution of phenolphtalein on the surface of the turbid liquid. (See Kremel, loc. cit.)

II. Sample D_I. Dry and hard tears. 1.8719 gms. yielded to alcohol 1.4254 gms. soluble matter, consuming 3.5 cc. semi-normal caustic potash. Acid number, 68.8.

III. Sample C_I. Dry, hard tears. 4.7596 gms. yielded to alcohol 3.4193 gms. soluble matter, consuming 7.56 cc. semi-normal caustic potash. Acid number, 61.91.

IV. Sample G. Granular, sticky mass. 51.3620 gms. yielded to alcohol 34.2834 gms. soluble matter, consuming 40.65 cc. semi-normal caustic potash. Acid number, 37.7.

V. Sample A. Granular, sticky mass, similar in appearance to IV. 28.4974 gms. yielded to alcohol 9.7418 gms. soluble matter, consuming 14.06 cc. semi-normal caustic potash. Acid number, 40.4.

From these results it follows:—

1st, That all these samples are evidently free from any appreciable admixture of white turpentine or rosin. In an investigating experiment, where white turpentine was purposely added to purified asafoetida, its amount was almost quantitatively indicated by the increased acid number of the mixture.

2nd, That the acid numbers of the different asafoetida specimens and parts thereof, while decidedly lower than those of white turpentine or rosin, are far from being concordant among themselves, varying from 31.1 to 68.8.

Still there seems to exist some regularity in these figures, inasmuch as they may be divided into two groups, the dry, hard tears possessing the highest numbers, (61.9 and 68.8), and the semi-solid mass having a lower number ranging from 31.1 to 40.4, or (leaving out the probably erratic figure 31.1) from 37.7 to 40.4.

Such variations in the acid number of different specimens of asafoetida have been observed before, as the following table to which the foregoing results are appended, will indicate.

III. The U. S. Pharmacopœia should give directions by which to ascertain the absence of white turpentine and rosin.

IV. The acid number of asafoetida seems to be higher for dry tears than for asafoetida mass. In these experiments the acid numbers varied from 61.9 to 68.8 for dry tears, and from 37.7 to 40.4 for asafoetida in mass.

V. It is very difficult, although not always impossible to obtain in the American market asafoetida that will meet the requirements of the U. S. P., which demands that it should yield to alcohol at least 60% of its weight. In the writer's opinion, our importers are at the mercy of persons beyond their supervision, and to demand that crude asafoetida conform to the requirements of the Pharmacopœia, will probably render it impractical for them to offer the drug in any considerable quantity. In this connection, the reader is referred to a valuable editorial concerning asafoetida in the Chemist and Druggist, May 7th, 1892, from which the following points are extracted:—

"The fact cannot be too strongly impressed upon the exporters in the East that it always pays best to send first-class goods. These are certain to find a market, while adulterated articles may often lie for months in the warehouses, waiting for a buyer, and condemned ultimately to pass for an old song into the hands of one or another of those firms on the fringe of the drug trade, to whom nothing is unsalable provided it is low-priced.

"The principal buyers of asafoetida in this market are the representatives of American drug houses, and the Americans whether from necessity or choice, are notorious for the eagerness with which they buy drugs of the finest quality. It was American firms who purchased the bulk of the gum which has been sold at our auctions this year, and it is only by providing a supply of marketable wares that their custom, advantageous both to our importers and to the shippers in India and Persia, can be kept here in the long run."

Table II.

Acid numbers.

Substance.	A. Kremel.*	E. Dieterich.*	Beckurts & Brüche.*	Our Results.
White Turpentine				153.3
Colophony (Rosin)	151—173	157—176	173—186	164.5
Asafoetida	26.8	11.2	40 *in massis*	61.9 dry tears
"	54.8	82.	29 *depurat.*	68.6 " "
"		70.	31 "	
"			43 *in massis*	37.7 soft mass
"			27 *in granis.*	40.4 " "

Summary.

I. The average amount of ash left in an ordinary specimen of commercially fair asafoetida is quite considerable, ranging in the samples herein treated, from 16% to about 20%. In some cases as high an average as 50% was observed. The purest tears left very little ash, ranging from 1.78 to 2.55%, and these selected tears yielded to alcohol as much as 76% of their weight.

II. The employment of a purified asafoetida is herein recommended, and the same should, in the writer's opinion, be the only official form of the drug for pharmaceutical use.

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* loc. cit.

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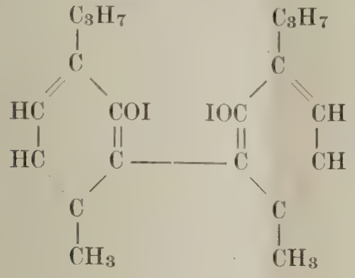
Halogen Derivatives of Thymol and Carvacrol.

By *Leo C. Urban.*

When thymol is acted upon in alkaline solution with iodine, a peculiar amorphous substitution product is formed. This product, known commercially as aristol, is considered as a derivative of dithymol and is represented by the formula $(C_{10}H_{12}OI)_2$ or structurally



On account of its insolubility in alkalies, it is assumed that it is the hydrogen of the hydroxyl group which is replaced by the iodine.

The same compound is formed when to such an alkaline solution of the phenol, in which an alkaline iodide has been dissolved, a solution of chlorinated soda is added.

A carvacrol iodide, said to be prepared in an analogous manner to aristol, has been described as a bulky, yellowish brown amorphous powder having a melting point of about 90° C.

The writer has prepared a carvacrol iodide, quite different from the above, by the following process:

Two grams of carvacrol and 3.8 grams of potassium iodide are dissolved in 40 cc. of a ten percent aqueous solution of sodium hydroxide. To this a solution of chlorinated soda is gradually added under continuous stirring until no more of a precipitate is formed. During the reaction, the mixture is kept cool by placing the vessel in cold water. The precipitate is collected on a filter, and washed first with water to which a very small quantity of alkali has been added, and then with pure water. It is then allowed to dry at the temperature of the room.

The product is a bulky, grayish-yellow or buff-colored, amorphous powder, having a faint aromatic odor. It is soluble in ether, chloroform, benzin and the fixed oils. From its solution in chloroform and ether it is precipitated on the addition of alcohol, becoming paler in color. This purified product did not show signs of shrinking until above 170° C. and at 200° C. had become black and tarry, but had not liquified.

The same compound is obtained by adding very slowly, and under continuous stirring, to a solution of 2 grams of carvacrol in 40 cc. of a ten percent aqueous solution of sodium hydroxide, an aqueous solution of iodine in iodide of potassium, until a precipitate ceases to form.

It combines the antiseptic properties of carvacrol with those of iodine and possesses the advantage over iodoform in being odorless or nearly so and in being more than four times as bulky.

The formation of this iodine compound suggested the possibility of obtaining analogous bromine derivatives.

Thymol bromide was prepared in a manner analogous to that used in preparing the iodide. Two grams of thymol and 2.5 grams of potassium bromide are dissolved in 40 cc. of a ten percent solution of sodium hydroxide. To this solution there is gradually added, under continuous stirring, an excess of a freshly prepared solution of chlorinated soda, the mixture being kept cool by placing the container in a vessel of cold water. A yellowish, bulky precipitate is slowly formed which is collected upon a filter, thoroughly washed with water, and dried on bibulous paper at the temperature of the room.

It formed an amorphous, yellowish, bulky powder, becoming paler on exposure to light. It is odorless or nearly so, and soluble in ether, chloroform, benzin and the fixed oils. Its solution in ether showed signs of decomposition, hydrobromic acid splitting off. When heated to 130° C. it began to shrink and at 150° C. it had changed to a dark brown tarry mass, liquifying at about 162° C.

Bromine estimations kindly made according to Carius by Mr. O. Schreiner, gave the following results:

I. 0.17227 gram of substance gave 0.1421 gram AgBr=0.06046 gram Br.

II. 0.16791 gram of substance gave 0.13867 gram AgBr=0.059004 gram Br.

Calculated for		Found	
$C_{10}H_{13}OBr$	$(C_{10}H_{12}OBr)_2$	I	II
34.93%	35.08%	35.09%	35.14%

Carvacrol Bromide was prepared in the same manner as the thymol derivative, substituting carvacrol for the thymol. It formed an amorphous, grayish-yellow or pale buff-colored powder, odorless or nearly so. Soluble in ether, chloroform, benzin and the fixed oils. At about 130° C. it began to shrink, and at 150° had become black and tarry. An etherial solution of this compound also showed signs of decomposition, hydrobromic acid splitting off.

A bromine estimation (Carius' method) also furnished by Mr. O. Schreiner resulted as follows:

0.14556 gram substance gave 0.1196 gram AgBr=0.05088 gram Br.

Calculated for		Found
$C_{10}H_{13}OBr$	$(C_{10}H_{12}OBr)_2$	
34.93%	35.08%	34.96%

Similar compounds are formed by acting directly on the alkaline phenol solutions with an aqueous solution of bromine.

If the iodides are looked upon as derivatives of the diphenols, the bromides must also be considered as such.

Amorphous chlorides of the phenols are also formed by treating alkaline solutions of these with freshly prepared solution of chlorinated soda or with an aqueous solution of chlorine. These compounds will be reported upon shortly.

Laboratory of the Kremers & Urban Co.

Roentgen's Rays.

By *Dr. Louis Kahlenberg.*

Since the time when Professor Heinrich Herz conducted his famous investigations on the relations between light and electricity, no discovery in the realm of physics has attracted so much attention on the part of scientists and thinking men in general as has the latest discovery of Dr. Roentgen, Professor of Physics at the University of Würzburg. Much of the misunderstanding that at first existed concerning the nature of this discovery is already being cleared away; still the fact that many of the more recent newspaper articles contain statements that are erroneous and need to be discarded before the true import of Prof. Roentgen's discovery can be properly appreciated will justify a brief description of the work of this physicist.

The beautiful mild light that is produced when the electric spark is passed through a Geissler's tube is familiar to all that are acquainted with common electrical phenomena. A Geissler's tube is a closed glass tube containing rarefied air, or some other gas, and having platinum or aluminium wires, electrodes, fused into its ends. These wires extend into the inside of the tube, while on the outside they are provided with loops or hooks for the attachment of wires that lead to an induction coil or a frictional electrical machine. If such a tube containing air of 1/300 of its ordinary density is connected with the poles of a powerful induction coil, the negative electrode (cathode) appears surrounded with a delicate, deep blue light, but from the positive electrode (anode) a beautiful light of the color of peach blossoms radiates into the tube filling it almost entirely, being separated from the blue light surrounding the cathode only by a dark space. This light streams from the anode towards the cathode, and if the tube is bent, follows all the crooks of the tube. If now the air is still further exhausted from the tube, the blue light surrounding the cathode, and the dark space that separates it from the light streaming from the anode expand more and more while the light from the anode recedes continually and finally disappears entirely. In tubes in which the air has been exhausted to about one-millionth of an atmosphere, this cathode light appears most intense. These cathode rays proceed in straight lines perpendicular to the surface of the cathode and their direction is not in the least influenced by the shape of the tube or the position of the anode. Where the rays of the cathode light strike the walls of the glass tube they cause the glass to emit a peculiar light of its own (fluorescence and phosphorescence). The cathode rays also cause many other substances to fluoresce. The color of the light emitted depends upon the nature of the substance. The Thuringian glass of which the Geissler tubes are often manufactured emits an apple-green light.

The properties of the cathode rays which have thus far been mentioned were first discovered by Prof. Hittorf of Münster, in 1869. Hittorf's work was verified by Crookes in 1879. The tubes that Crookes used contained cathodes that ended in metallic disks, either plane or concave. Crookes called these rays radiant matter and assumed in them a fourth state of matter. It is important to observe here that the luminous rays emitted from the cathode can be deflected from their course by a magnet. According to Hittorf, a pencil of luminous cathode rays behaves like a bundle of stiff fibres fastened only to the cathode, whereas the light from the anode behaves like a bundle of flexible fibres fastened at both ends. Two parallel pencils of luminous cathode rays repel each other.

In 1894 Herz found that cathode rays differ from ordinary light in that they penetrate more readily those solids through which ordinary light can pass only with great difficulty or not at all, as for example sheets of metal. Again he found that substances which transmit ordinary light readily proved an overwhelming obstacle to the cathode rays. In the same year Ph. Lenard,[1] working in the laboratory of Herz, experimented on the cathode rays and prepared some photographs, using this light.

It was with a view toward the further elaboration of these experiments that Roentgen was conducting researches with the cathode rays, and he found them to posess a most remarkable property. In a dark room he had a Crookes' tube emitting the cathode rays. The tube was enclosed in a black paste-board box so that no light whatever was visible. He noticed that a paper screen coated with a fluorescent substance (barium platino cyanide) was caused to emit a greenish fluorescent light when brought into the neighborhood of the tube. This fluorescence occured even when the coated paper was held at a distance of six feet from the tube. Now it was evident that this fluorescence was caused by rays of some kind that were being emitted from the Crookes' tube, rays which, however, do not act on the optic nerve. For the lack of a better name, Roentgen calls these rays X-rays for the present. By placing different objects between the Crookes' tube and the fluorescent screen, it was found that all were permeated to a greater or less extent by the X-rays. Thick wooden boards or plates of hard rubber interposed between the tube and the screen decreased the fluorescence but little, the rays also passed through a book of 1000 pages, through the fleshy parts of the hand and many other substances. Metals and glass were found to obstruct the passage of the rays very greatly, and when used in sufficient thickness did not allow them to pass at all. The objects all cast a more or less dark and sharply defined shadow on the fluorescent screen according as the substances of which they were composed were of greater or less density. Thus when the hand was interposed between the tube and the screen the bones of the hand gave a darker shadow than did the softer parts and so there appeared on the screen a dark shadow of the bones surrounded by a lighter shadow of the softer parts.

Now these X-rays have been found to act chemically upon ordinary photographic plates;[2] and when the screen of barium platino cyanide is replaced by a photographic plate (which by the way can remain in its paste-board or wooden holder, since X-rays easily pass through pasteboard and wood) and an object, say the hand, is placed between the excited Crookes' tube and the plate, the latter will be protected from the action of the rays by the hand, as far as the latter covers it, much more, however, by the bones than by the fleshy parts. After exposing[3] the plate from ten minutes to an hour in the manner described, the plate is developed and fixed in the usual way. Thus a negative is obtained in which the bones of the hand appear light and the softer parts somewhat darker. From this negative pictures (positives) can be printed by the usual process. These pictures, it will be at once seen from what has been said, are simply shadow pictures of the objects taken. In these pictures the denser parts of the object appear darker than the parts less dense; thus in case of the hand the outlines of the bones appear much darker than those of the softer parts. As there is no **light** acting on the sensitive plate in the production of these pictures the latter can not be called photographs. The term **radiograph** has been suggested for them; whether this name will finally be adopted remains to be seen. The pictures differ too from ordinary photographs in that they are only shadow pictures or silhouettes of the objects taken. Several other such pictures were prepared by Roentgen. A set of weights in a closed wooden box yielded a picture in which the weights appeared as heavy dark shadows on a light back ground, showing the faint outlines of the box. Similarly a picture of the coins in a closed leather purse was taken, etc.

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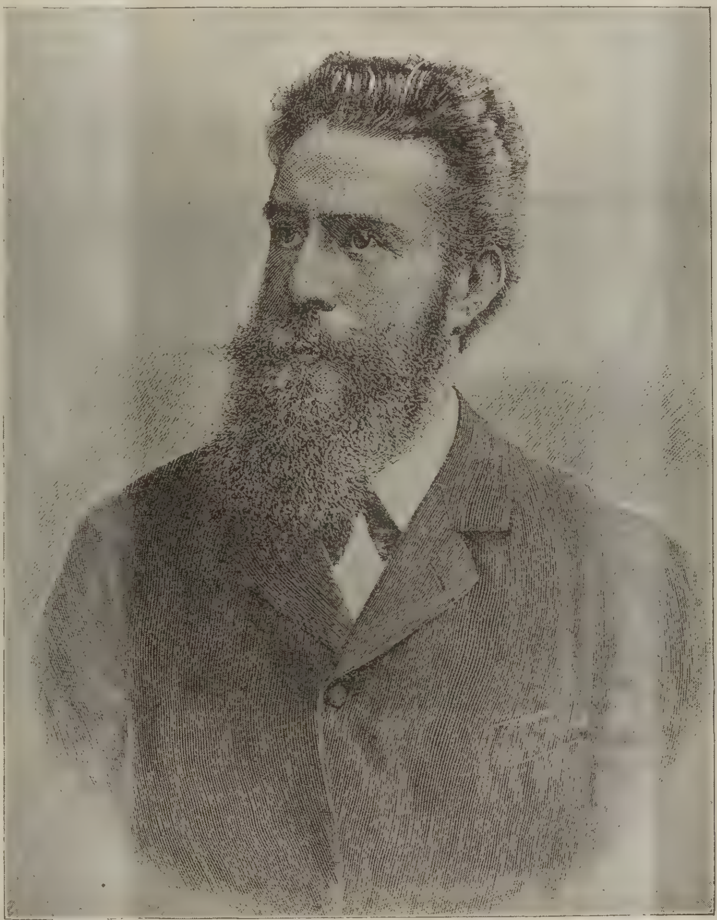
[1] Wiedemann's Annalen der Physik, vol. 51, p. 225. 1894. See also ibid., vol. 52, p 28, on "Magnetische Ablenkung der Kathodenstrahlen."

[2] Whether the rays act directly on the photographic plate, or whether the action is produced by fluorescent light formed as the rays strike the plate is a question that Roentgen leaves open.

[3] A camera is of course not needed in this work, as is evident from what has been stated. Lenses are not only unnecessary but can not be used, because glass, being quite dense, offers a great obstacle to the passage of X-rays.



Prof. W. C. Roentgen.

These experiments have been verified by many physicists in Europe and America. At the University of Wisconsin such pictures were also prepared by Dr. L. W. Austin, who has kindly furnished the negative from which the accompanying figure has been prepared.

As to the practical use to which the X-rays can be put, many speculations are being made. At present the rays are chiefly being used to prepare pictures such as have been described. Imperfect as this method of taking pictures still is, medical men have already used pictures thus prepared in making diagnoses. Thus bullets and needles that had penetrated different parts of the body have been accurately located and consequently easily removed. Cases where coins and other metallic bodies had been lodged in the digestive tract, have also been successfully diagnosed by the aid of pictures taken by means of X-rays. Surgeons have been able to inspect fractures and deformities of the bones by the aid of this method, and in Vienna lately a case of urinary calculus has been diagnosed by means of this new kind of photographs, if we may so call them. Thus the new discovery has already proved itself of practical importance to medical practitioners. That it will become still more valuable in this line as the process of taking the pictures is more perfected there can be no doubt.

Engineers and metallurgists are attempting to avail themselves of these shadow pictures produced by X-rays in locating defects in iron and other metals. It is to be hoped that their efforts in this direction will be crowned with success.

From the scientific standpoint of view, the interesting question arises, — what is the nature of these X-rays of Roentgen? Attempts that have been made to refract these rays have proved unsuccessful; for this reason it has not as yet been possible to concentrate these rays by means of a lens of any kind, and so the pictures that have been prepared thus far are as large as the objects themselves. Attempts to reflect X-rays have also been futile thus far. It has been determined that the intensity of the fluorescence on the screen varies inversely as the square of the distance of the screen from the Crookes' tube.

At first one would be inclined to suppose that the X-rays are cathode rays. Roentgen rejects this view mainly for the reason that X-rays cannot be deflected by a magnet as can cathode rays. Goldstein of Berlin claims to have shown that cathode rays consist of more than one kind of rays, and that while certain ones of these rays are deflected by a magnet, others are not at all influenced even by the most powerful magnets. Thus it might be that after all X-rays form a part of the cathode rays, which according to Goldstein are composite. Roentgen, however, is of the opinion that X-rays are produced when the light strikes the glass sides of the tube and produce fluorescence. The possibility that X-rays might be identical with the ultra-violet of the spectrum is also discussed by Roentgen, but discarded because X-rays have entirely different properties from those of the ultra-violet or ultra-red rays of the spectrum that have thus far been investigated.

Roentgen first made his researches public in a preliminary report before the "physikalisch-medizinische Gesellschaft" of Würzburg. Later appeared a ten-page pamphlet[4] containing this report. To elucidate the matter considered in the two preceding paragraphs further, little better can be done than to quote Prof. Roentgen's own words with which he closes his pamphlet.

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[4] Publisher, Stahel in Würzburg.

"Legt man sich die Frage vor, was denn die X-Strahlen, — die keine Kathodenstrahlen sein können, — eigentlich sind, so wird man vielleicht im ersten Augenblick, verleitet durch ihre lebhafte Fluorescenz und chemische Wirkungen an ultraviolettes Licht zu denken. Indessen stösst man doch sofort auf schwerwiegende Bedenken.

a) dass es beim Uebergang aus Luft in Wasser, Schwefelkohlenstoff, Aluminium, Steinsalz, Glas, Zink, keine merkliche Brechung erleiden kann;

b) dass es von den genannten Körpern nicht merklich regelmässig reflektiert werden kann;

c) dass es somit durch die sonst gebräuchlichen Mittel nicht polarisirt werden kann;

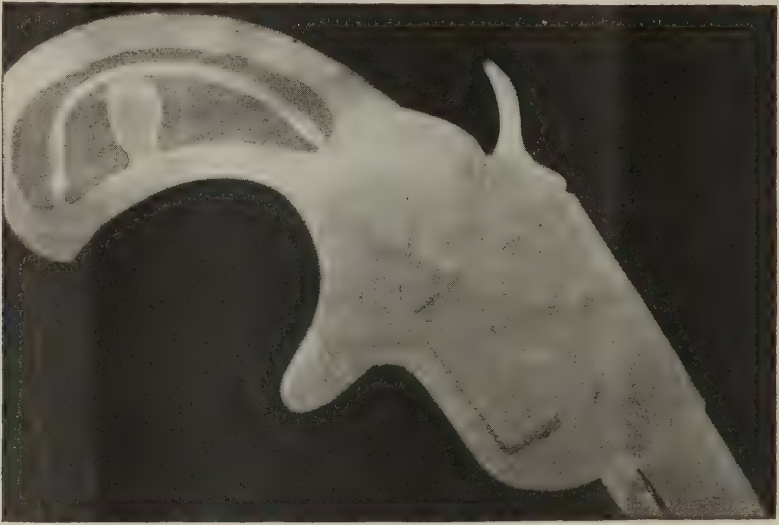
d) dass die Absorption desselben von keiner anderen Eigenschaft der Körper so beeinflusst wird als von ihrer Dichte.

Das heisst man müsste annehmen, dass sich diese ultravioletten Strahlen ganz anders verhalten als die bisher bekannten ultrarothen, sichtbaren und ultravioletten Strahlen. Dazu habe ich mich nicht entschliessen können und nach einer anderen Erklärung gesucht.

Eine Art von Verwandtschaft zwischen den neuen Strahlen und den Lichtstrahlen scheint zu bestehen, wenigstens deutet die Schattenbildung, die Fluorescenz und die chemische Wirkung, welche bei beiden Strahlenarten vorkommen, darauf hin. Nun weiss man schon seit langer Zeit, dass ausser den transversalen Lichtschwingungen auch longitudinale Schwingungen im Aether vorkommen können, und nach Ansicht verschiedener Physiker vorkommen müssen. Freilich ist ihre Existenz bis jetzt noch nicht evident nachgewiesen, und sind desshalb ihre Eigenschaften noch nicht experimentell untersucht.

Sollten nun die neuen Strahlen nicht longitudinalen Schwingungen im Aether zuzuschreiben sein? Ich muss bekennen, dass ich mich im Laufe der Untersuchung immer mehr mit diesem Gedanken vertraut gemacht habe und gestatte mir denn auch diese Vermuthung hier auszusprechen, wiewohl ich mir sehr wohl bewusst bin, dass die gegebene Erklärung einer weiteren Begründung bedarf."

Professor Boltzmann shares Roentgen's view that the X-rays are longitudinal vibrations of the ether. Boltzmann thinks that the cathode rays as well as the X-rays are longitudinal waves of the ether, the former of very short and the latter of greater wave length; side by side with these waves he places the waves discovered by Herz as transverse waves of large wave length. According to Boltzmann the greatest value of Roentgen's discovery lies in the fact that through it we have become acquainted with an entirely new agent. The discovery of the rays of Herz and also of the cathode rays attracted much attention, though the former are not essentially different from light rays and the latter are confined within the space of a Hittorf's tube and consequently are of little use in science and the arts. The X-rays, however, are entirely new. They radiate out into space and through the efforts of their discoverer, Roentgen, have already proved themselves very valuable.



Reproduction of a negative taken with Roentgen's rays.

The Pharmaceutische Post of Jan. 26, attempts to point out a connection between Roentgen's rays and a "peculiar fluid" which Carl von Reichenbach called "Od." Reichenbach, the discoverer of creosote and paraffin, who died Jan. 16, 1869, published several works, the most important of which was entitled, "Der sensitive Mensch und sein Verhalten zum Od."[5] Later appeared "Die odische Lohe" published by Braumüller, then followed "Odisch-magnetische Briefe." In these books Reichenbach speaks of a peculiar fluid by means of which "sensitive persons" are able to see distinctly objects enclosed in metallic boxes and to recognize certain parts in the interior of the human body. The Post claims that a further analogy between Reichenbach's "Od" phenomena and Roentgen's rays exists because Reichenbach claims to have photographed shadow pictures in the dark by means of the "Odlicht." A sensitive plate prepared by coating one side with a layer of a silver salt was used, and when the sensitive side was turned toward the object the silhouette-like pictures were obtained, whereas, when the other side of the plate was turned toward the object the process was not always successful. Whether the claims of the "Post" be well founded or not is a question that can only be settled by further investigation. It should not be disguised either that there are many that would be inclined to question Reichenbach's observations.

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[5] Cotta, Stuttgart, 1854.

A late number of The Chemist and Druggist contains an account of the meeting of the Academy of Sciences at Paris Jan. 27. The salient points in the report of this meeting are here given. Prof. Lannelongue discussed the application of the new discovery to surgical diagnosis. He confirmed many of the statements that had been made concerning the localizing of injuries and diseases of the bones and states that good results had also been obtained in diagnosing the area of tuberculosis in the hand. M. Perrin, of the physical laboratory of the École Normal, said he had corroberated Roentgen's experiments, and had found that X-rays were not at all reflected nor refracted. He shared the view of Roentgen that the rays are not cathodic, saying that the two are no more alike than are the hammer that strikes the bell and the sound that is produced. M. G. Le Bon then made the startling statement that he could do with ordinary light what had been done with X-rays. He placed a negative over a sensitive plate, put the two in a light-tight box made of iron and lead, and before the iron plate of the front of the box he placed an ordinary paraffin lamp. In less than three hours he obtained a negative. M. Le Bon's idea is that the whole thing is done by heat rays.

Without entering into further discussion concerning the matter, it appears from what has been said concerning the properties of X-rays and from the process used by M. Le Bon, that the latter is dealing with an entirely different phenomenon.

The attention that X-rays are at present receiving at the hands of so many able experimentors, would lead us to hope that the process of taking pictures by their action will ere long become much more perfect and consequently more useful than it now is. Already the time of exposures (from ten minutes to an hour) is being reduced and sharper pictures are being obtained. It is to be hoped that a means of concentrating these rays will ere long be found. What we may expect of these wonderful rays of Roentgen as casting light upon our knowledge of radiant energy in general and as furnishing other practical applications, further investigations only can reveal.

MONTHLY REVIEW.

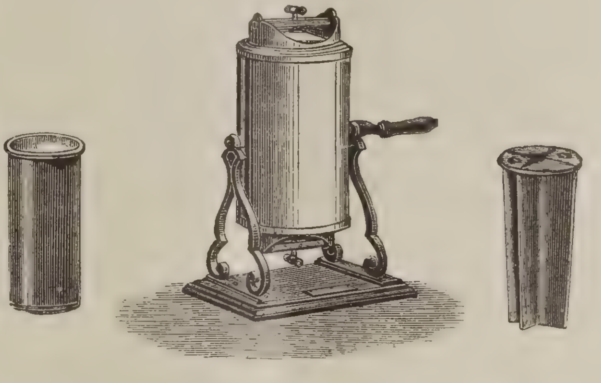
Pharmaceutical Technique.

Ice Machine.

The firm of Warmbrunn, Quilitz & Co. of Berlin, has recently brought out a small ice machine, which may be of use to druggists of small towns, especially in warm countries where ice is difficultly obtainable.

The machine, (see cut), consists of a double-walled tin cylinder, covered with asbestos and intended to hold the freezing mixture; and the inside tin vessel, cross-shaped in transverse section, in which the ice is formed. The tin cylinder rests on an axis and can be rotated by means of a crank.

To prepare ice the operator proceeds as follows: The inner vessel is filled to within a cm. from the top with as cold water as can be procured; distilled water previously boiled and cooled should be used if germ-free ice is desired. The vessel is then covered with a thick sheet of rubber, a tin plate placed over this and the cover screwed on. The machine is now inverted and 3 kg. of dry ammonium nitrate are poured into the cylinder, followed by 3 litres of cold water, after which the cover is secured. After turning for 20 minutes, the cover is quickly removed and the inner vessel taken out and dipped into hot water, when the ice will drop out by simply inverting the vessel.



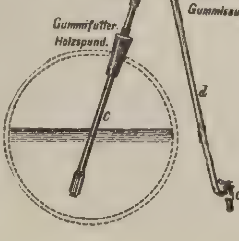
The action of the machine depends upon the absorption of heat when dissolving the ammonium nitrate in water, the reduction of temperature in this case being about 25° C. The colder the materials, the more rapidly will the ice be formed, of course. Water above 15° C. should never be used; if it is impossible to cool the water in any other way, it should be placed in a vessel surrounded by a freshly-prepared solution of ammonium nitrate.

After the ice has been formed, the liquid in the cylinder generally has a temperature below zero (C.), and can still be used for cooling beverages and the like. The yield of ice by this machine is 500 gms. in 20 minutes, and since the ammonium nitrate can be recovered by evaporation of the solution, the expense is very slight. [N. Ph. Manual, VI, Nachtrag.]

A New Siphon.

A patent siphon has recently been put on the market by the firm, Hch. Hartwig of Gehberg, Thüringen, Germ., of which the following is a reproduction:

The siphon is placed in the liquid, the stop-cock *a* closed, *b* opened, and the liquid made to rise in the shank *c* by means of the rubber suction-bulb. The shank *d* is filled by the overflow of *c*, but care must be taken not to apply the suction too rapidly, to avoid sucking up any of the liquid into the bulb. The stop-cock *b* having been closed, the siphon is ready for work.



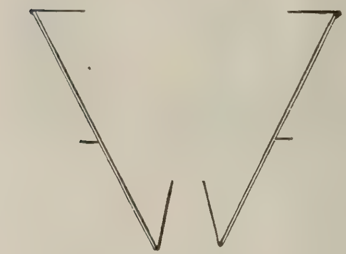
If it is desired to fasten the siphon so that the shank *c* shall not move, special wooden bungs are used. The rubber connection is loosened, the shank inserted in the bung from the bottom upwards, and is fastened by placing a piece of rubber tubing between the wood and the glass. The bung is fastened into the barrel or carboy, the shank forced down to near the bottom of the vessel, and the connections again made.

To empty the siphon, the suction bulb is removed, *b* opened, and the shank *c* emptied by raising the valve at the bottom by means of a wire or stick. The shank *d* is emptied through *a*.

[N. Ph. Manual, VI, Nachtrag.]

Heat-collector for Evaporation and Boiling.

During the process of evaporation over a free flame, on a wire gauze or a sand-bath spirting is apt to occur toward the end of the operation unless a very small flame is used. In this case, however, the duration of the process is inconveniently prolonged. In order to concentrate the heat and to evaporate as rapidly as possible with a small flame Drs. Peters and Rost of Berlin have constructed the following apparatus.



A cone of sheet iron, which can be mounted on a tripod by means of small lateral projections, is coated with asbestos on the outside. The lower end of the cone is provided with a chimney as illustrated by the accompanying cut.

Half a liter of water, which under given conditions of surface of evaporation and of flame required seven and one half hours for complete evaporation, in the same evaporating dish and with the same flame required but two hours for complete evaporation when this heat-collector was used. Similar experiences were had with salt solutions. All experiments conducted clearly show that the same result can be accomplished in much less time and with less fuel with this heat jacket than without it. Copper rings are used to adapt the heat-collector to evaporating dishes of different sizes.

Chemistry.

Synthetic Cassia Oil.

It has been shown by the chemists of Schimmel & Co.* that cinnamic aldehyde is the only essential constituent of cassia oil, as far as flavor is concerned. The Chinese oil is so grossly adulterated with petroleum and colophonium that oils which ought to contain at least 75% aldehyde contain not more than 35 to 50 percent. Aside from the low percentage of aldehyde the adulterants are decidedly objectionable. Synthetic cinnamic aldehyde has now not only become possible on a commercial scale, but can be produced so cheap, that it will no doubt replace the natural product. This result may have a wholesome effect on the Chinese traders in teaching them the lesson that modern synthetic chemistry defies their cunning.

The Existence of Aluminium Borate.

Until recently it was generally supposed that solutions of borax and alum act on each other with the formation of a basic aluminium borate. About the middle of last year the announcement was made that this precipitate was not a borate at all, but aluminium hydroxide pure and simple. J. Martenson recently had occasion to doubt this new claim. In going over the work he produces results, which he states agree well with the older statements of H. Rose.

[Oesterr. Zeitsch. f. Pharm., 50, p. 80.]

Preparation of Vanillin.

The different methods according to which vanillin can be prepared have been summarized by J. Altschul as follows:

1.) Upon oxidation of aliphatic side chains, vanillin has been obtained from the following substances: a.) coniferin, glycovanillin, olioil, acethomovanillinic acid, acetferulaic acid; b.) eugenol, isoeugenol, aceteugenol, eugenolacetic acid, acetisoeugenol, benzylisoeugenol, methyleneisoeugenol, isoeugenolphenylacetic acid, isoeugenoltoluic acid.

2.) *p*-nitro-*m*-methoxybenzoic aldehyde, which can be converted into vanillin, has been obtained from the following substances: toluene (through *p*-nitro-*m*-chlortoluene), cinnamic acid (through *m*-methoxycinnamic-acidester), benzaldehyde (through *m*-amidobenzaldehyde.)

3.) The following derivatives of protocatechuic aldehyde can be methylated and thus converted into vanillin: the bimetallic salts, monoacetylderivative, benzyl-compound and benzene-sulphonate.

4.) Guaiacol can be converted into vanillin: a.) by introducing an aldehyde group upon treatment with chloroform and caustic potash; b.) by introducing an aldehyde group into guaiacolcarbonic acid and splitting off carbon dioxide; c.) through guaiacol dicarbonic acid. [Pharm. Centralh. N. F., 16, p. 721.]

Occurrence of two kinds of Mannan in the Roots of Conophallus Konyaku.

It was shown by Tsuji that the root of *Conophallus* contains a large amount of an anhydride of mannose; it is now shown by Y. Kinoshita that two kinds of mannan are present. The finely ground root was repeatedly extracted with boiling water until the extract was no longer slimy. The residue yielded mannose when boiled with dilute acid, and the slimy extract, on the addition of alcohol, yielded a copious, nearly white, flocculent precipitate; the latter when dried at 100°, was no longer soluble in water, but yielded mannose when boiled for some hours with 4 per cent sulphuric acid. This mannan differs from that obtained from yeast by Salkowski in losing its solubility on drying, but agrees in its behavior with basic lead acetate (no precipitate), ferric chloride, and ammonia (gelatinous precipitate), copper sulphate and sodium hydroxide (thick, blue precipitate), and also with Fehling's solution.

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* See *Bericht* for 1889, 1890 and 1891.

The slimy mannan was not altered by the diastase of malt, by invertase or emulsin, and Osawa's experiments on dogs showed that it is digested with much more difficulty than starch. An enzyme capable of saccharifying the mannan must, however, exist in the konyaku root, and the author hopes to isolate it.

[J. C, S., 70^{II}, p. 60; from Bull. Coll. Agric., Imp. Univ. Tokyo, 2, p. 205.]

Conversion of Chlorine into Hydrogen Chloride.

According to **Richard Lorenz**, chlorine is completely converted into hydrogen chloride by passing it, mixed with steam, through a tube filled with coke, and heated to a faint red heat. The action is expressed by the equation $2Cl+H_2O+C=2HCl+CO$, and so complete is it that the gases issuing from the hot tube do not contain sufficient chlorine to give a reaction with potassium iodide and starch. After absorption of the hydrogen chloride by means of water, the residual gas is almost pure carbonic oxide, containing only a very small quantity of carbonic anhydride.

[J. C. S., 70^{II}, p. 17; from Zeit. anorg. Chem., 10, p. 25.]

Preparation of Tin Tetrachloride in Large Quantities.

Richard Lorenz has demonstrated that tin tetrachloride is most easily prepared by the action of chlorine on tin at the ordinary temperature. The most suitable apparatus is a tube closed at one end, 5 to 6 cm. wide, and 75 to 100 cm. long, fitted with a condenser and a tube by means of which dry chlorine can be passed to the bottom of the tube, where it bubbles through a little tin tetrachloride. The tube is filled nearly to the top with granulated tin. 1½ to 2 kilos. of the tetrachloride are easily prepared in about one hour. The product is pure, and boils at 114°.

[J. C. S., 70^{II}, p. 28; from Zeit. anorg. Chem., 1895, p. 44.]

Calcium Permanganate.

This salt is prepared by decomposing a solution of barium permanganate with calcium sulphate, filtering, concentrating the filtrate, and crystallizing. The crystals formed resemble those of potassium permanganate, and are freely soluble in water. In its antiseptic action, calcium permanganate is said to be 100 times as strong as the corresponding potassium salt, or even stronger than mercuric chloride. Because neither caustic nor toxic, it can be used for sterilizing drinking waters.

[Zeitsch. des allgem. österreich. Apoth. Ver., 1895, p. 796.]

Botany and Pharmacognosy.

Camphorleaf Oil.

In view of the rapid depletion of the natural camphor forests of Japan and of Formosa, attempts to cultivate the tree in other countries have been made and have met with more or less success. The camphor tree has been found to flourish in India and Ceylon; it has become naturalized in Java, Brazil, Jamaica and others of the West Indian islands as well as in Mauritius and Maciva. In our own land it is now cultivated in Florida and California.

Since in the Orient only the wood of the older trees is said to be used, the branches and leaves being discarded, the question arises concerning the camphor-content of these parts. **David Hooper** has given results bearing on this point. Fifty pounds of leaves from a tree grown at Ootacamund in India were distilled in water for six hours giving eight fluidounces of oil, a yield of one percent of essential oil. The color was slightly yellow, specific gravity at 15° C., 0.9322 and a rotation of + 9.4 in a two decimeter tube was found. It began to boil at 175°. The quantity of camphor obtained was small.

A second sample of leaves was obtained from Naduvatam, a situation about 1000 feet lower than the former. A treatment similar to the above yielded four ounces of liquid and a mass of crystalline matter suspended in it. On straining off the oil through a cloth, a cake of camphor weighing two ounces remained. The clear oil had a specific gravity of 0.9314 at 15° C., rotated a ray + 54° in a two decimeter tube and boiled regularly at 165°. Taking into account the camphor condensed in the cool tube, the oil from this sample yielded about 75 percent of camphor. It is regarded by the author as probable that further decrease of elevation would still further increase the yield in camphor. [Pharm. Jour., 1896, p. 21.]

Ramie.

According to **C. O. Bornig**, ramie, the fibre derived from *Boehmeria*, is the material of the ancients, which has been called linen and cotton by translators. The fibre is an extraordinarily pure cellulose exceeding even cotton in purity, and by improved methods of preparation becomes a rival to silk in lustre and susceptibility to color. The fibre is long and very strong, and is capable of being woven into cloth of almost any texture. The native *B. cylindrica* has a good quality of fibre, but the species usually cultivated is *B. nivea*. The latter is grown in Louisiana, Texas and California, and as a manufactured article reaches this country from China under the name of China grass cloth.

[Bot. Gazette, 21, p. 98; from Dry Goods Bulletin 18, p. 12.]

Cuscuta Epithymum.

The common dodder is a parasitic plant of the order *Convolvulaceæ*, and is said to possess diuretic and laxative properties, and to be a specific for gout. **Gaston Barbey** has examined the extract from 2 kilos. of the plant. The aqueous extract is acid and yields a precipitate with potassium hydrogen carbonate, from which a yellow, amorphous powder, cuscutin, is extracted by ether. It is also precipitated by dilute sulphuric acid, and the residual solution then reduces alkaline copper tartrate. The alcoholic extract of the residue from the aqueous extract, yields a further quantity of cuscutin. Resinous and fatty products were also isolated, together with a tannin and a small amount of a crystalline substance, having a faint odor of cumarin.

Cuscutin is insoluble in cold water, and only sparingly soluble in boiling water, yielding a yellow solution, from which it is precipitated in the amorphous form on cooling; with concentrated sulphuric acid it gives a reddish-brown solution, having a green fluorescence; it is also soluble in acetic acid without change of color. With ferric chloride, the aqueous solution gives a characteristic and very delicate violet-grey turbidity, red by transmitted light. Cuscutin is very soluble in alkalies, giving yellow solutions, which dye silk and paper and stain the skin. Cuscutin is hydrolysed by mineral acids yielding glucose, and a resinous substance, cuscuretin, and it is, therefore, a glucoside. No analytical data are furnished.

[J. C. S., 70^{II}, p. 65; from J. Pharm., 1895, [6], 2, p. 107.]

Practical Pharmacy.

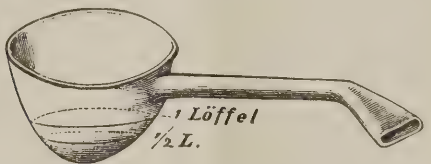
Adulteration of Codeine.

Upon dissolving some codeine in 50—60% alcohol, J. Etiévant found that the solution was turbid and after a short time a white sediment appeared. This latter was easily soluble in water and upon closer examination proved to be sugar. The codeine had been adulterated with rock-candy, the crystals of which resemble those of codeine very closely. Upon dissolving the mixture in hot water, adding a few drops of sulphuric acid, neutralizing with caustic potash, and the subsequent addition of Fehling's solution, the adulteration of codeine with sugar is easily detected. Besides this, the difference in optical properties could be used; sugar is dextro-, codeine laevo-rotatory.

[Rep. de Pharm., 1895, p. 11.]

Medicine Spoon.

The firm of Becker and Marxhausen in Kassel has introduced a glass medicine spoon called *Bequem* (convenient), which is deserving of its name wherever it is disirable to administer medicines or liquid food to patients in a lying position. The spoon has a capacity of 600 cc., is graduated on the outside and can easily be kept clean. The spilling of liquid is excluded inasmuch as the liquid is not administered by means of the bowl, but through the handle.



[Illustr. Ztg., 1896, p. 89.]

Sulphur as a Preservative of Chloroform.

According to L. Allain, chloroform saturated with sulphur in the cold may be kept in direct sunlight for months, without undergoing change; in particular, no carbonyl chloride is formed. This stability is not due to any change produced by the sulphur, for the redistilled liquid rapidly decomposes when exposed to the same conditions. As the anæsthetic properties of the chloroform are not modified by the presence of the sulphur, the addition of this preservative is to be recommended.

[J. C. S., 70^{I}, p. 3; from J. Pharm., 1895, [6] 2, p. 252.]

Sulphume Remedies.

These remedies, manufactured by the Sulphume Co. of Chicago, were analyzed by H. Wefers-Bettink and J. van Eyk. A solution, salve, and pills were examined. The solution was found to be essentially a solution of calcium polysulphides, the well-known solution obtained by boiling sulphur with milk of lime. The "Sulphume Ointment" contained about 2.5% of calcium polysulphides, dissolved in water, mixed with yellow vaseline and perfumed with expressed oil of nutmeg. The "Sulphume Pills" contained some free sulphur (probably formed by the decomposition of the polysulphides in contact with organic matter); also podophyllin, with licorice root extract, and wheat-starch as excipients. [Apoth. Zeit., 1896, p. 27; from Nederlandsche Tydschrift voor Pharm., 1896, p. 14.]

Bromidia.

According to the manufacturers, Battle and Co., St. Louis, one teaspoonful of Bromidia contains 1 gm. each of chloral hydrate and potassium bromide, together with 0.008 gm. each of extracts of *Cannabis Indica* and *Hyoscyamus*, and aromatic extracts. According to recent analysis, 15% each of chloral hydrate and potassium bromide were found; also 11% of sugar, though this result may be too high due to the probable presence of glycyrrhizin from extract of liquorice. No reactions were found that corresponded to those produced by known extract of Cannabis Indica; and this, together with the fact that too little alcohol is present in the preparation to dissolve such a resinous extract, leads the analyst to doubt the presence of any Indian Hemp whatsoever. Hyoscyamine was indicated by Vitali's reaction and the mydriatic effect of the alkaloids extracted. Morphine was found to be absent.

[Pharm. Ztg., 1895, p. 749.]

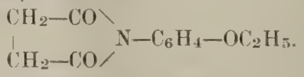
On the Preservation of Inks.

Most inks, but especially those containing gums or sugar, are liable to decomposition, due either to a fungus growth on their surface, to their becoming slimy, or to the production of lactic acid which destroys the coloring matter. The latter two causes are due to the growth of bacteria in the ink. Copperas and alum have both been used as preservative agents and are quite effective in retarding or preventing bacterial or fungus growths, but inks to which these salts have been added are apt to lose color upon standing. Carbolic acid in quantities of 0.1% or even less prevents all decomposition of inks but its disagreeable odor prevents its extensive use. It has been found that 0.1—0.2 gms. of salicylic acid added to a liter of any ink will preserve the same indefinitely, while being free from all the objections above mentioned.

[Neueste Erfindungen und Erfahrungen, 1896, p. 62.]

Pyrantine, a new Antipyretic.

This substance, first prepared by A. Pintti, is *p*-aethoxylphenylsuccinimid:



$$\begin{array}{l} CH_2\text{—}CO\diagdown \\ \mid \qquad\qquad\quad N\text{—}C_6H_4\text{—}OC_2H_5. \\ CH_2\text{—}CO\diagup \end{array}$$

It is made by fusing the hydrochloric acid salt of *p*-amidophenetol with succinic acid, or phenacetine with succinic acid, and extracting the fused mass with boiling alcohol. Pyrantine crystallizes in colorless, prismatic needles, melting at 155° C., insoluble in ether, almost insoluble in cold water, soluble in 83.6 parts of boiling water. By the action of alkalies it is converted into the salts of *p*-aethoxylphenylsuccinamic acid, which are soluble in water and can therefore be used subcutaneously. Pyrantine used in the clinics at the Universities of Naples, Padua, and Pavia was found to reduce the body temperature 1°—3° C., without having any action on the blood. Neither were any bad effects noticed on the heart, the respiration, or the organs of digestion. Pyrantine is especially recommended for rheumatic fevers in doses of 1—3 gms. daily.

[Chem. Zeit., 1896, p. 54.]

Food Stuffs.

Copper in Wine.

The substitution of copper sulphate for flowers of sulphur in combatting diseases of the grape-vine, though more economic, appears to be accompanied, at least at times, with rather serious results. Prof. H. Karsten attributes the cholera, which he found in central Switzerland in almost epidemic form, to the presence of copper in wine. A knife-blade placed in a tumbler of wine for twelve hours was covered with a readily perceptible coating of copper. He further supposes that the copper got into the wine through its use as a disinfectant on the grape-vine.

[Oesterr. Zeitsch. f. Pharm., 50, p. 84.]

Iron in Food.

Almost the only data with regard to the amount of iron in food, are those of Boussingault (Compt. rend., 74, 1352), and his results are too high. The great difficulty in work of this kind is complete incineration; which in the present research, by Ralph Stockman, was accomplished by heating the ash with a mixture of hydrochloric and sulphuric acids; the residue was then taken up with dilute sulphuric acid, reduced with zinc, and titrated with potassium permanganate.

The ordinary daily diet was found to contain about 9 or 10 milligrams of iron; but in chlorotic people who take but little food, the amount was about 3 milligrams. The following articles of diet were also analysed in the same way.

Milk from 2 to 4.3 milligrams per litre.

Oat meal 3.5 milligrams per 100 grams (dried).

Bread from 0.61 to 0.85 milligrams per 100 grams (dried).

Yellow ox marrow 2.5 to 4 milligrams per 100 grams (dried).

Red calf marrow 7.6 to 8.7 milligrams per 100 grams (dried).

Beefsteak 3.9 milligrams per 100 grams (dried).

[J. C. S., 70^{II}, p. 43; from J. Physiol., 18, p. 484.]

Mannan as Human Food.

From the tuberous roots of *Conophallus konyaku*, a food consisting of colorless, gelatinous tablets, is prepared and is largely consumed in Japan. It is made, according to C. Tsuji, by mixing the ground root with slaked lime (1 part) and water (2 parts), after which it is boiled with lime water until it forms a gelatinous mass.

When boiled with 3 per cent. sulphuric acid, the root yielded 55.86 per cent of mannose, assuming the whole of the sugar present to be mannose, as is very probable. The mannan present in the root must be digested by the enzymes in the intestines, and transformed into mannose or a dimannose, corresponding with the maltose made from starch. Attempts to convert the mannan of konyaku into a sugar by means of diastase from malt were unsuccessful.

[J. C. S., 70^{II}; from Bull. Coll. Agric. Imp. Univ Tokyo, 2. p. 103.

Bacteriology.

Sodium Fluoride as Antiseptic.

According to the *Nouveaux Remèdes*, fluoride of sodium, fluorol, is reported by Duclos to be a valuable antiseptic. It is prepared in the form of a bluish-white, odorless powder of saline taste. It is preferable to sublimate which is sixteen times more poisonous, also to silver nitrate, formalin and permanganate, for when employed in hypodermic injections it is painless. In one per cent. or even half per cent. solutions, it acts as a powerful germicide. Lagrange states that probably its efficiency is due to the fact that it does not coagulate albumen like sublimate, consequently the microbes are not protected by an envelope of coagulate albumen. It is especially useful in ophthalmic practice; the lachrymal mucous membrane tolerates injections of fluorol without the least reaction since it is neither caustic nor painful and provokes no irritation.

[Pharmaceutical Journal, 1896, p. 33.]

Physiology, Pharmacology and Therapy.

Formation of Blood from Organic Iron.

As a contribution to the disputed question whether organic iron is absorbed and contributes to blood (hæmoglobin) formation, Jos. A. Kunkel, made experiments on two puppies; one received milk, in which the amount of iron was ascertained, the other the same food plus iron. The milk contained about 1 milligram of metallic iron (1.4 milligrams Fe_2O_3) per litre. The extra iron given daily was 30 drops of *liquor ferri albuminati* of the German Pharmacopœia (= 4.4 milligrams of iron.) During life the blood was examined at weekly intervals. After death, other organs were submitted to analysis. The main facts are given in the following table. It shows a greater amount of iron in the dog to which iron had been administered.

	Dog A, with iron.		Dog B, without iron.	
Percentage of Fe_2O_3 in blood in successive weeks.	1. 0.0486 2. 0.0388 3. 0.0286 4. 0.0334	5. 0.0363 6. 0.0384 7. 0.0348 —	1. 0.0448 2. 0.0503 3. 0.0259 4. 0.0303	5. 0.0234 6. 0.0227 7. 0.0195 —
After death.	Weight.	Total Fe_2O_3.	Weight.	Total Fe_2O_3.
	grams	gram	grams	gram
1. Total blood	—	0.0404	—	0.0252
2. Liver..........	133.8	0.0317	151.2	0.0043
3. Spleen........	7.2	0.0043	7.3	0.0013
4. Kidneys.....	27.0	0.0025	30.2	0.0014
5. Ribs...........	11.1	0.0011	9.9	0.0001

[J. C. S., 70^{II}, p. 47; from Pflüger's Archiv., 61, p. 595.]

Toxic Substance from the Supra-renal Capsules.

According to D. Gourfein, the glycerol extract of the supra-renal capsules contains proteids which are precipitated by alcohol, and have little or no toxic effect, together with substances which are not precipitated by alcohol and are highly toxic. As the latter are not decomposed by heat, the capsules can be extracted with hot water, the solution precipitated by alcohol, and the clear liquid evaporated on a water bath. The product when injected subcutaneously causes death in a short time, and seems to act on the central nervous system. The proportion of the poison in the supra-renal capsules is variable, but no similar effects are produced by extracts of the spleen or the muscle of the same animals treated in the same way.

[J.C. S., 70 , p. 49; from Compt. rend., 121, p. 311.]

Succus Entericus of Sheep.

The intestinal juice has been investigated chiefly in carnivora. The only previous experiments on herbivora were made on a goat by Lehmann, who found the juice had no digestive action. The present experiments, by Fritz Pregl were made on a lamb. The juice was collected by a modification of the Thiry-Vella method, from 3 to 5 grams of juice being obtained from the loop per hour. It is a mucous, strongly alkaline fluid, which is rich in proteid, and tends, like pancreatic juice, to set into a jelly spontaneously; its specific gravity is about 1.014. It contains about 0.2 per cent. of urea. The following analysis is given in parts per 1000.

Sodium carbonate	3.69
Albumen and globulin	18.09
Albumoses and mucin	1.27
Urea	2.29
Other organic substances	3.31
Ash	1.27
Water	970.05

On proteids, cellulose, pentoses and fats, it has no digestive action, but it converts starch and glycogen into dextrose with intermediate dextrins; it inverts cane sugar and maltose, but not lactose.

[J. C. S., 70^{II}, p. 49; from Pflüger's Archiv., 61, p. 359.]

Action of Mustard and Pepper on Disgestion.

According to Gottlieb, observations of the constant and regular secretion of the pancreatic juice, by means of a canula in the pancreatic duct of a rabbit, showed that the introduction of mustard or pepper into the stomach caused the secretion to be three or four times as large; the juice was somewhat abnormally watery, but possessed the same digestive properties.

[J. C. S., Vol. 70 , p. 42; from Exp. Stat. Record, 7, p. 48; from Verhandl. Natur. Med. Ver., Heidelberg, 5.]

Lactase of the Small Intestine.

Franz Röhmann and J. Lappe have investigated the action of the small intestines of calves, oxen and young and old dogs, on solutions of milk sugar. The intestines were also extracted with chloroform, with thymol solution, and with sodium fluoride solution, and the action of these extracts on the milk sugar studied. In all cases, with the exception of ox intestine, after digestion for several hours, dextrose could be identified in the solution by means of its osazone. Alcohol precipitates from the above extracts of the intestine a substance which will also hydrolyse milk sugar.

Quantitative experiments as to the amount of dextrose formed were also made.

[Ber., 28, p. 2506.]

Scientific Societies.

Recognition of Pharmacy by the Academy.

The *Académie des Sciences* has awarded the *Prix Jecker* to M. Tanret, a French pharmacist in Paris, with the sum of 6000 francs from the fund attached to the prize, and the title of *Lauréat de l'Institut.* Tanret is best known to pharmaceutical students for the successful isolation of constituents of drugs, e. g. ergotinine, pelletierine, heperidin etc.

At the occasion of the hundreth anniversary of the French Institute, M. Moissan, professor of toxicology at the *École de Pharmacie de Paris*, and member of the French Academie of Sciences and of the Academy of Medicine, was promoted to the position of officer of the Legion of Honor.

Universities and Colleges.

Attendance at German Universities.

The number of students attending German universities during the last semester was 29,117 against 29,107 last summer and 28,158 a year ago. Of these 870 are pharmaceutical students against 883 last winter. Of the entire number 2,287 were foreigners, the greatest number on record.

It may not be amiss to call attention to the fact that in 1885 the German empire had a population of almost 47 millions, and that every prospective pharmacist must attend some university for four semesters, the greater part of the last semester being given up to examinations.

Monument for Professor Endlicher.

The academic senate of the University of Vienna has permitted the erection of a monument in the arcades of the university in honor of the well-known botanist, Dr. S. L. Endlicher, formerly professor of botany and director of the botanical garden.

Jurjew.

The elimination of the German element from the University of Dorpat, now Jurjew, apparently is not being attended with very happy results. Both the successor of Prof. Dragendorff and the dean of the medical faculty have had serious encounters with the students. If the reports of anarchy which are circulated are true the situation is certainly very deplorable.

Another Seventieth Anniversary.

Prof. Conizzaro, the famous Italian chemist, will celebrate his seventieth birthday on July 12th of this year. Italian chemists are actively making preparations for a fitting celebration of the day.

Literary.

Books and Pamphlets Received.

Vandenhoeck und Ruprecht—Göttingen. Jahresbericht der Pharmacie. Herausgegeben vom Deutschen Apothekerverein. Bearbeitet von Dr. Heinrich Beckurts, o. Professor an der techn. Hochschule zu Braunschweig. 29. Jahrgang, 1894. (Der ganzen Reihe 54. Jahrgang.) Ein Bd., pp. VI, 894. 1895. M. 22.00.

Jahresbericht über die Fortschritte in der Untersuchung der Nahrungs- und Genussmittel. Bearbeitet von Dr. H. Beckurts. Sonderabdruck aus dem Jahresbericht der Pharmacie. 4. Jahrgang 1894. Ein Bd., pp. 197. 1895. M. 5.60.

Lea Brothers & Co.—Philadelphia. The Year-Book of Treatment for 1896. A critical review for practitioners of medicine and surgery. One vol., 12 mo., pp. 484. 1896. Cloth $1.50.

Deutsche Verlags-Anstalt—Stuttgart. Lexikon der gesammten Technik und ihrer Hilfswissenshaften. Herausgegeben von Prof. Dr. Otto Lueger, Civil-Ingenieur in Stuttgart, im Verein mit Fachgenossen. Mit zahlreichen Abbildungen.

X. Abtheilung (Schluss des zweiten Bandes). Brautthuer—Calcium karbonat. pp. 641—800. 1895. M. 5.00.

XI. Abtheilung. Calcium oxyd—Dampfkessel. pp. 1—160. 1895. M. 5.00.

Verlag der H. Laupp'schen Buchhandlung—Tübingen. Einleitung in das Studium der Chemie. Von Dr. Ira Remsen, Professor der Chemie an der Johns Hopkins Universität in Baltimore. Autorisirte deutsche Ausgabe. Bearbeitet von Dr. Karl Seubert, a. o. Professor der Chemie an der Universität Tübingen. Zweite Auflage. Ein Bd., pp. XVI, 474. 1895. M. 6.00.

——Kurze Anleitung zur Massanalyse. Mit spezieller Berücksichtigung der Vorschriften des Arzneibuches. Bearbeitet von Dr. Luwig Medicus, a. o. Professor an der Universität Würzburg. Fünfte und sechste Auflage. Ein Bd., pp. X, 158. 1895. M. 2.40.

Verlag von Leopold Voss—Hamburg. Anleitung zur Microchemischen Analyse der wichtigsten organischen Verbindungen. Von H. Behrens, Professor an der Polytechnischen Schule zu Delft.

Erstes Heft. (Anthracengruppe, Phenole, Chinone, Ketone, Aldehyde.) Mit 49 Figuren im Text. pp. VIII, 64. 1895. M. 2.00.

Zweites Heft. (Die wichtigsten Faserstoffe.) Mit 18 Figuren im Text und drei Tafeln im Farbendruck. pp. VIII, 108. 1896. M. 5.00.

Julius Springer—Berlin. Neues Pharmaceutishes Manual. Von Eugen Dieterich. Mit in den Text gedruckten Holzschnitten. Nachtrag zur sechsten Auflage. Ein Bd., pp. 72. 1896. M. 2.00.

J. B. Baillière et Fils—Paris. Formulaire des Médicaments Nouveaux pour 1896. Par H. Bocquillon-Limousin, pharmacien de 1re classe. Avec une introduction par Henri Huchard, Médécin de l'Hopital Necker. 7e édition, revue, corrigée et augmentée. 1 vol. in—18, pp. VIII, 306. 1896. Cartonné 3 fr.

J. J. Heines Verlag—Berlin. Wie leitet man eine Versammlung? Geschäftlicher Handweiser für Vorsitzende. Von einem Mitgliede des deutschen Reichstages und des preussischen Abgeordnetenhauses. Ein Bd., pp. 88. M. 1.00.

Author—Brooklyn. An Ephemeris of Materia Medica, Pharmacy, Therapeutics and Collateral Information. January 1896. By Edward R. Squibb, M. D., Edward H. Squibb, S. B., M. D., Charles F. Squibb, A. B. Vol. IV. No. 4, pp. 1673—1757.

Burroughs, Welcome & Co.—London. Chemists Vest Pocket Diary and Ready Reference. pp. 155. 1896.

Author—Ann Arbor. The Chemical Laboratories of Germany. By Prof. A. B. Prescott. Pamphlet, pp. 14.

Proceedings of the Ohio State Pharmaceutical Association at its seventeeth annual meeting held in Sandusky, June 4, 5 and 6, 1895, together with the constitution, by-laws, pharmacy law, adulteration law, poison law, label law and morphine law, also list of members. One vol., pp. 108. 1895.

Reviews.

Jahresbericht der Pharmacie. Herausgegeben vom Deutschen Apothekerverein. Bearbeitet von Dr. Heinrich Beckurts, o. Prof. an d. techn. Hochschule in Braunschweig. 29. Jahrgang, 1894. (Der ganzen Reihe 54. Jahrgang). Vandenhoeck und Ruprecht, Göttingen, 1895. M. 22.00.

At the beginning of this century it was possible for a single person to accomplish remarkable results in more than one science. Likewise it was possible for one person to record annually the progress made not only in one but in several sciences. Since then conditions have changed materially. The physicist finds it wellnigh impossible to keep abreast with the progress of a closely related science, chemistry. He seldom if ever claims to keep posted on the progress made by botany or zoology. This is equally true of the chemist and of other scientists.

It is no doubt true that the man of science in one department does not remain totally ignorant of the progress made in other departments. Even the public at large becomes aquainted with remarkable discoveries of a more or less popular character. The educated scientist may even keep up a reading knowledge of the progress made in other departments and may be able to converse intelligently about recent discoveries in other branches of science.

The truly educated man, however, no matter how well read he may be outside of his particular domain, will be very cautious when he leaves his own territory of research and study. Knowing only too well from the mistakes made by others in writing about the chapter of science in which he is master, he is aware that the lack of a full knowledge of essential details might lead him astray when venturing critically into the fields cultivated by others.

This may be construed as a sad confession of the modern scientist, who has sacrificed breadth for the sake of depth of knowledge. Such an explanation of modern conditions would be as superficial as unjust. It is true an Alexander von Humboldt would be impossible to-day, but it is equally true that many a scientist of to-day has a better conception of the universe than the writer of the cosmos. Depth of true specialization is possible only on a broad foundation and constantly broadens the mental horizon. The botanist of to-day who studies the histology and micro-chemistry of a single section must have a better knowledge of physics and chemistry in order to interpret correctly what he sees, than the botanist of the good old times who had stored away in his memory the names of all plants known in his day and who possessed a similar stock of information in the other sciences of his generation.

To write abstracts of scientific articles and to catalogue them is doing to-day practically what the old herbalist did in former generations. A thorough, though elementary course in biology will give the student a better understanding of life, both vegetable and animal, than a lifetime spent in collecting, drying and labeling plants.

The person who desires to be informed to-day with regard to the progress made by any particular science, or branch of any science, does not want to plod his way through a host of abstracts no matter how accurately and systematically they may be arranged. Ten pages of more general information written by a person who is a master of the field, will be worth more to him than a hundred pages of disconnected details. This should not be construed to imply that there is no use for a most comprehensive catalogue of detailed information.

Pharmacists who are interested in the progress of the pharmaceutical sciences, however, are less interested in details than in general outlines of progress. The pharmaceutical sciences are too numerous to enable one man to grasp or digest all the details. Yet the intelligent practicing pharmacist, on account of the varied branchings of his science is possibly more in need of annual reports on the various sciences than any other person. The pharmaceutical specialist will be equally eager for such information, though he will also welcome the detailed catalogue of all important articles published during the year.

It may not be practicable, it may not even be wise to write separate reports for both classes. However, the greater need, the spreading of that general information of progress, should not be sacrificed for the sake of a more detailed catalogue.

It does not seem possible for any particular person to abstract intelligently the more important scientific publications of the year that appear in the various departments of science. Still less will it be possible for one person to present a birdseye view of the annual progress in these various departments.

An ideal report on the progress of pharmacy cannot be expected. Better reports, however, should be possible if the efforts of more scientists were united in the writing of such a report. Of the three annual reports, that of the German Apothecaries Society is not only the oldest, but also the most complete. The Jahresbericht, however, does not pretend to be anything more than a catalogue of abstracts. The complaint of the publishers that so few pharmacists purchase the Jahresbericht although it is annually recommended by the "entire professional press", no doubt finds its explanation in this fact. The busy pharmacist has no time to read all the detailed information about alkaloids, volatile oils, sugars and the like. He wants to know in a general way what progress is being made in these directions, but the information that he desires will not consist of a host of details boiled down to catalogued abstracts but will be best contained in an essay on these subjects. Such essays would be equally sought by the specialist in other departments of the same science. The specialist will also welcome the catalogued facts. It must not be supposed, however, that a series of abstracts no matter how good, can or will replace the original articles. The Jahresbericht will always remain a valuable adjunct to a series of the best journals, but in the library of the University or of the specialist it can never replace them. *E. K.*

Dictionnaire de Physiologie par Charles Richet, Profésseur de Physiologie à la Faculté de Médicine de Paris. Tome Premier, A—B, avec gravures dans le texte. Fascicule 2e pp. 337—672. Ancienne Librairie Germer Ballière et Cie, Paris; Felix Alcan, Éditeur, 1895. 8 fr. 50 centimes.

The second fascicle contains 66 articles: from *aliments* (cont.) to *Aristote*. The last two articles viz. *Argon* and *Aristote* indicate in a striking manner the wide scope of the work not only with regard to subject matter but also as to time. The first communication with regard to argon by Lord Rayleigh and Prof. Ramsay to the British Association was made in Aug. 1894. The last observation recorded in the Dictionnaire is that by Berthelot made known April 16th 1895.

The thinking chemist will no doubt ask of what significance can the inert argon be in physiology? Prof. Richet indeed has but a short paragraph on the physiology of the subject. He states: "We are not able to foresee the consequences of this recent discovery on the theory of respiration. The fact that the solubility of argon is greater than that of nitrogen, permits us solely to suppose that the blood ought to dissolve a certain quantity of argon. If it is assumed that the blood dissolves 2.4 parts of so-called nitrogen it follows that there ought to be about 0.4 parts of argon to 100 parts of blood (?)."

The article *Aristote* on the other hand furnishes 5½ pages of historical information, which will interest not only the physiological specialist but the general reader as well. The authors are evidently thoroughly embued with the historic spirit. Prof. Richet who has also written this article concludes the subject with the following paragraph, which manifests the spirit in which it was written.

"These quotations may suffice to judge the work of the master. He may truly be called master, who during eighteen centuries reigned in science without compeer. But, however grand he may be, it is well that he was dethroned. Nature is richer than the works of even the greatest man; and when Harvey tried to demonstrate some of the most important laws of physiology he was unfortunately opposed by the teachings of Aristotle. In the search for truth which we pursue with ardor, our predecessors ought not to prove themselves an obstacle but a support."

A very timely article is that on antitoxines, which developes historically and discusses the various phases of the subject under a number of headings, viz: Theories of immunity and addition, doctrine of vaccination, discovery of antitoxic elements, mechanism of antitoxic effects, hereditary transmission of antitoxic attributes, serum therapy, etc.

Other articles that are of interest to any scientific reader are those on antisepsis and asepsis, with an interesting historical chapter; antiseptics, with tables of comparative value; anæsthetics, general and local, with several pages of bibliography for the specialist; carbohydrates; altitudes, with tables of altitudes of health resorts, principal cities, and mountains arranged geographically; and anthropology.

Chemical elements receiving special consideration together with their compounds are aluminium, antimony, silver. Organic chemicals deserving special attention are aniline, antipyrine, apocodeine, apomorphine, arabinose, amylnitrite. Articles of special interest to zoologists, are those on amoebae and spiders (*Arachnides.*) *E. K.*

Anleitung zur mikrochemischen Analyse der wichtigsten organischen Verbindungen. Von H. Behrens, Professor an der polytechnischen Schule zu Delft. Heft II. pp. 108. Mit drei Tafeln in Farbendruck. Leopold Voss, Hamburg and Leipzig. 1896. M. 5.00.

The work of which this is the second part, seems to be a departure in a new directon, one which is likely to yield good returns. In this second installment of his work, the author, already well and favorable known among users of the microscope by reason of his helpful works bearing on the technique and method of microscopic investigation in botany, is again dealing in the main with plant subjects; it seeming rather a work of histology than of chemistry as we ordinarily think of it. He here takes up the microscopic study of the different fibres made use of in the industries.

In the first section of the work, a description of the most important fibres as they ordinarily appear under the microscope is given, both of those used in spun fabrics and in paper making. Their conduct under polarized light is described and some space is devoted to the action of the various reagents that swell and dissolve them as well as the color reactions following treatment with the various staining media.

In the second section, the spun fibres are grouped according to their conduct toward stains and polarized light, a sort of analytical key resulting. The special reactions of the various kinds of fibre then follow in considerable detail.

The third section is devoted to the investigation of papers and their constituent fibres. The ash residue, and the finishing materials, as sizing and coloring agents, receive attention. A scheme for identification similar to that in the second part renders it possible to conveniently place any of the various fibres used. By means of three colored plates, the effect of stains is illustrated.

In this little work, we see the apparently impractical scientific basis supporting an exceedingly practical structure, granting that things industrial are things practical. To those interested in fibres from either the economic or the scientific standpoint, this will doubtless be a welcome contribution. *R. H. True.*

Commentar zum Arzneibuch für das Deutsche Reich. Herausgegeben von H. Hager, B. Fischer und C. Hartwich. Zweite Auflage. Mit zahlreichen Textabbildungen. In zwei Bänden. Verlag von Julius Springer, Berlin.

This comprehensive commentary on the Pharmacopœia of the German Empire has met with such deserved success that a second revised and enlarged edition could be issued in a comparatively brief time after the appearance of the first edition. This and the first volume of the new issue have been reviewed in these pages. Upon the appearance of the last volume, the excellent work calls for no further commendation than to call anew the attention to its completion and its usefulness for pharmacopœial study. Paper, print and illustrations are excellent. *Fr. H.*

Neues Pharmaceutisches Manual. Nachtrag zur sechsten Auflage. Von Eugen Dieterich. Ein Band, p. 73. Verlag von Julius Springer in Berlin, 1896. M. 2.00.

The sixth edition of Dieterich's Pharmaceutisches Manual, to which this book is a supplement, was reviewed in the Pharm. Rundschau, 1894, p. 223. Instead of publishing a new edition, the author has thought it best to embody the necessary changes and additions in a small, separate volume, and thus save the increased cost of a large book. That the public will be better satisfied with this plan there can be no doubt, as the buying of separate editions of costly books, differing but slightly from one another, is a considerable burden to most people.

Most of the first half of the small book is taken up with corrections of and additions to the formulas in the original volume. The introductions to several of the chapters, e. g., that on extracts, have been almost entirely rewritten and brought up to date. Pharmaceutical technique has not been neglected, and we find excellent descriptions and illustrations of some of the latest devices of use to the pharmacist. The latter half of the volume is a new departure: an alphabetical list of substances mentioned and technical expressions used in this and the original volume, together with their Latin, French and English translations. This is especially intended to facilitate the use of the book for readers unfamiliar with German, but it is too incomplete by far to serve this purpose.

A number of very simple words as, *und*, *gelb*, *sauer*, *braun*, etc., have found their way into the list, while many technical expressions used frequently in Dieterich's Manual and which cannot be found except in the larger dictionaries, are omitted. It would also have been well for the author to have entrusted the compilation of the translations to a person or persons familiar with the respective languages. This would have avoided such translations as the following: *Gaze*—gas (for gauze); *niederschlagend*—temperens (for precipitating); *Rosenhonig*—melrose (for honey of rose); *Sardelle*—sardel (for sardines); *bestimmt*—determinate (for determined); *Watte*—wad (for cotton); etc. Besides dozens of similar translations, the English part is full of typographical errors that are inexcusable in a work of this kind.

The paper, print and binding of the book are excellent, and a credit to the publishers.

R. Fischer.

Lehrbuch der praktischen Photographie. Von Dr. Adolf Miethe. Verlag von Wilhelm Knapp. Halle. pp. 440. Mit 170 Illustrationen. 1896.

This book, as the title indicates, is a text-book of photography, intended especially for the use of practical photographers. It contains, however, much of value to amateurs who wish to make photography a study as well as pastime.

The author begins, in true German fashion, at the bottom, treating briefly those properties of light which determine the formation of the image, discussing the different errors of lenses and explaining clearly the method employed by the lens-maker in correcting them. The following chapters give minute directions for testing lenses and some excellent advise on the choice of objectives for the particular use for which they are intended. The remainder of the book is devoted to: The Chemistry of Photography; Photographic Apparatus; Negative and Positive Processes; Reproduction and Enlarging; Orthochromatic Photography; and finally to Photographic Aesthetics. The author shows himself throughout a master of his subject, with more than the usual faculty for putting scientific facts in simple yet accurate language.

C. B. Thwing.

Jahresbericht über die Fortschritte in der Untersuchung der Nahrungs- und Genussmittel. Bearbeitet von Dr. H. Beckurts, o. Professor an der Herzogl. techn. Hochschule in Braunschweig. Sonderabdruck a. d. Jahresbericht der Pharmacie. 4. Jahrgang, 1894. Vandenhoeck und Ruprehr, Göttingen. 1895. M. 5.60.

In accordance with the idea that the peculiar training of the pharmacist should fit him for the work of a general analytical and sanitary chemist, the *Jahresbericht für Pharmacie* has for a number of years given a liberal amount of space to the subject of food stuffs, also a number of pages to toxicological chemistry. Inasmuch as the offices of apothecary and food chemist or forensic chemist are as a rule not held by one person, the publishers of the *Jahresbericht für Pharmacie* have considered it advisable to issue parts IV (*Chemie der Nahrungs- und Genussmittel*) and V (*Toxicologische Chemie*) as a separate volume under the title of *Jahresbericht der Nahrungs- und Genussmittel.* The volume before us is the fourth of this kind and contains a classified catalogue of abstracts of articles and references to books published in 1894.

What has been stated in a general way with regard to the need of more general annual reports of progress in connection with the *Jahresbericht für Pharmacie* does not apply with equal force to this part of the work. However desirable and instructive a more general report on the subject of food stuffs might be made, the food chemist largely wants to know about details of analytical processes, about the standards of various countries, etc.

The articles receiving special treatment are those usually discussed in similar works, viz.: milk, cheese, butter, fats and oils, wax, meat and meat preparations, flour, bread, etc. A chapter that will appeal to the pharmacist, though he may not be interested in the chemistry and adulteration of food stuffs, is that on secret remedies. Analyses of a number of such secret nostrums are recorded. A chapter of equal interest to pharmacists and analytical chemists is that on toxicological chemistry. For ready reference the book is provided with a detailed index.

E. K.

Kurze Anleitung zur Massanalyse mit spezieller Berücksichtigung der Vorschriften des Arzneibuches. Bearbeitet von Dr. Ludwig Medicus, a. o. Professor an der Universität Würzburg. Fünfte und sechste Auflage. Verlag der H. Laupp'schen Buchhandlung, Tübingen, 1895. M. 6.00.

Whereas the later editions of the United States Pharmacopœia have many of the aspects of a text-book, the German Pharmacopœia, or *Arzneibuch* as it is now called, has more the character of a briefly descriptive catalogue. As a result text-books leading the student to an understanding of the ofttimes meagre descriptions of the pharmacopœia are by no means scarce.

The brief introduction to volumetric analysis by Prof. Medicus, which has already gone through four editions and which has again been printed in a double edition will be found serviceable as a guide to students beginning the study of volumetric analysis. The book is of a sufficiently elementary character and free from confusing details, so that any student with an elementary knowledge of chemistry can readily comprehend the text. In fact, details have apparently been studiously avoided. Thus e. g. under the heading of burettes only two are mentioned, viz: Mohr's with a pinch-cock and Gay Lussac's burette. In this country the latter is found oftener in the cabinet and used for lecture demonstration than for actual use in the laboratory, Mohr's burette with a glass stop-cock being almost universally employed when rubber must be avoided. But when not carried too far, as in this instance, simplicity and absence of unnecessary details in an elementary text-book are an advantage. Although the author does not at all restrict himself to the German Pharmacopœia, the book is written with special reference to the needs of pharmaceutical students. The student who has used this book as an introduction to volumetric analysis certainly should find no difficulty in using as a reference book any of the larger and more comprehensive treatises, in the application of volumetric methods to his everyday analytical needs.

E. K.

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EDITORIAL.

The Berlin Industrial Exhibition of 1896.

Among the several events in commemoration of the 25th anniversary of Berlin as national capital of the German empire, the municipal authorities jointly with the commercial, industrial and professional branches have decided upon an industrial exhibition on a grand and national scale, which will be open from May 1 to October 15, 1896, in one of the beautiful parks on the banks of the river Spree, in the northern part of the great metropolis. This enterprise has met with the favor and support of the national government and the German people in general and is in prompt progress toward completion.

The main object of this exhibition is to present a complete picture of the achievements of the industries and arts of Berlin, to demonstrate their magnitude and progressive character as well as their importance in the national life of Germany and the commerce of the world. Special attention will be devoted to those branches of industries and arts which have prospered for a long time in Berlin and gained a world-wide reputation. In connection with them a vast number of masterpieces of former centuries will be exhibited, and the emperor of Germany has consented to loan many treasures of industrial art in his possession, and in that of the Royal Museums. The city authorities of Berlin have erected a magnificent pavillion, in which a detailed representation of the famous institutions of the municipal administration will be on exhibition, including canalisation, public health and charities, etc. In addition to these exhibits such departments as public education, trade-schools, sanitary institutions and matters, prevention of accidents, horticulture etc. will be amply represented.

The German colonial exhibition will also form a comprehensive and instructive display, especially of African products, and will be of general interest and importance.

The exhibition grounds in the Treptow Park have a greater area than those of most international exhibitions hitherto held in Europe, and offer particular advantages by their close proximity to the city and their picturesque beauty. They comprise with the adjacent territory an area of about one million square meters, and are mostly covered with beautiful, well-cultivated groves, lawns and plots of flower-beds, reflected with their verdure and floral splendor in the waters of the broad river that flows past them.

The main building (illustration, 1) covers an area of 53,000 square meters. Other great structures of similar magnitude are the buildings for chemistry, physics, physical, mathematical and other instruments, and of photography, including lecture halls for public demonstrations; the fishery building, the halls for food products, for machinery, for engineering, for electricity, the exhibition-buildings of the municipality of Berlin and hundreds of minor buildings, all of great architectural variety and beauty.

Two of the great side-shows of the grand exhibition will be "Old Berlin" and the "Streets of Cairo". The former will be a faithful and most artistic reproduction of parts of the old capital. This wonderful construction of the ancient city of the Margraves will present in every way a correct reproduction of Berlin in those days, long passed, when the people of the Mark Brandenburg were the strong guardians of the extreme outposts of German life. "Cairo", far surpassing in magnitude and beauty the rather primitive representation of a street of Cairo in Midway Plaisance at the Chicago Fair, is mainly destined as a market-place for the great industrial activity and art-reproduction of Berlin. Here German art of imitative decoration is to demonstrate what perfection it has obtained in copying from nature as well as from artistic models of all ages.

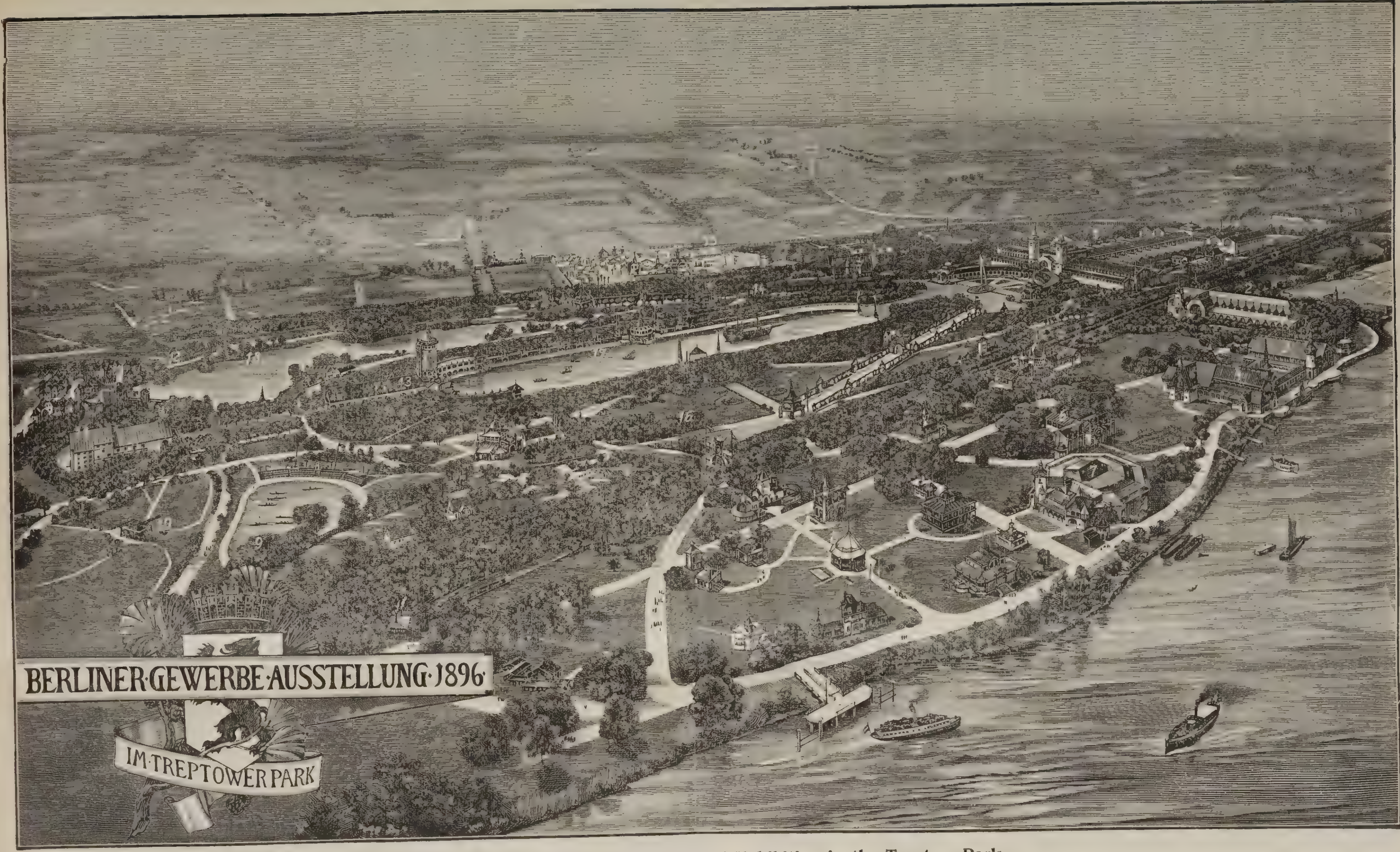
The exhibition comprises the following 23 groups:

1. Textile fabrics;
2. Clothing industries;
3. Building and engineering;
4. Wood manufactures;
5. Porcelain; Delftware and glassware;
6. Bric-a-brac, fancy goods, etc.;
7. Metal industries;
8. Graphic and decorative arts, printing, engraving, books, maps, binding, etc.;
9. Chemical industries, dyes and dying, etherial oils, mineral waters, pharmaceutical products and apparatus, etc.;
10. Foods and food products;
11. Scientific and surgical apparatus and instruments:
12. Musical instruments;
13. Machinery, shipbuilding and transportation;
14. Electricity (joint exhibit of the Association of German Electric Engineers);
15. Leather and rubber industries;
16. Paper manufacture and industries;
17. Photography and related arts and apparatus;
18. Sanitary institutions;
19. Education and educational institutions and methods;
20. Fisheries, boating and kindred sport;
21. Driving, horsemanship, water sports, cycling and aeronautics;
22. Horticulture;
23. German colonial exhibition.

The birds-eye view of the greater part of the exhibition grounds and buildings on page 75 will, better than any detailed description, give a general and correct idea of the extent and the grandeur of the Berlin exhibition. Contrary to American custom, the exhibition buildings will be kept open till a late hour at night, and will be brilliantly illuminated by electric light. The grounds of the exhibition and all the restaurants and side-shows will remain open until midnight, and amusement and entertainment for the visitors in the best of taste and of the most varied kind and perfection will be provided.

Comparisons of the various great exhibitions of recent years are rather out of place and mostly misleading. After the magnificent World's Fair in Chicago, however, Americans are justified, when making such comparisons, in choosing a rather lofty standard for subsequent national or international exhibitions. American readers of the *Review* and American visitors to the coming Berlin exhibition who may still be under the overwhelming impression of the magnitude and immensity of the unsurpassed fair of the "White City" may, however, be assured that a visit to the Berlin industrial exhibition will be in no way a disappointment. The completion of the fair-grounds and buildings, of the access by land and water from all parts of the great metropolis, is in full progress, and gives even now in the changeable days of the mild German spring weather the impression of a national enterprise on a magnificent scale. They will certainly compare advantageously in natural scenery and in architectural, ornamental and floral beauty with the large area and structure of the "White City". Upon a close survey of the grounds and buildings at the Treptow Park the writer can assure his American readers and friends that whoever contemplates and can afford to make an European trip during the coming summer, should not fail to make Berlin the foremost object of a prolonged stay. No one will ever regret this visit, but will, no doubt, take home enduring impressions of delight received in this wonderful modern centre of the highest types of arts, sciences, industries, trades and commerce, as well as of a great metropolis famous by its model municipal administration.

Berlin, March 1, 1896. *Fr. H.*



Birdseye view of the Berlin Industrial Exhibition in the Treptow Park.

1. Mainbuilding. 2. Chemical industries, chemical, physical and surgical instruments and apparatus. 3. Foods. 4. Fisheries and sports. 5. Exhibits of the administration of Berlin. 6. Water- and gas supplies. 7. Great Alpine panorama. 8. Restaurants. 9. Marine displays. 10. Giant telescope. 11. Old Berlin. 12. German colonial exhibition. 13. Main Restaurant. 14. Educational and benevolent institutions. 15. Cairo. 16. Horticulture. 17 and 18. Lakes.

ORIGINAL CONTRIBUTIONS.

The Quantitative Estimation of Carvone in Volatile Oils.

By *Edward Kremers* and *O. L. Schreiner.*

(Report of the *Research Committee* C, U. S. P. Revision.)

Occurence of carvone.

Carvone has thus far been proven to exist as a natural constituent in only five oils. Dextrogyrate carvone occurs in caraway oil[1] (*Carum carvi*) and dill oil[2] (*Anethum graveolens*). Laevogyrate carvone occurs in spearmint oil[3] (*Mentha viridis*), in the allied *Krauseminz oel*[4] (*Mentha crispa*) and in kuromoji oil[5] (*Lindera sericea*).

Methods of quantitative estimation.

The quantity of carvone in these oils has been determined by different methods each of which appears to give different results. The literature on the carvone content of these oils is therefore rather unsatisfactory. The methods that have been devised and used at different times are the following:

I. By fractional distillation.[6]

A fraction boiling within several degrees on either side of the boiling point of carvone is collected and weighed as such.

II. By means of the crystalline hydrogen sulphide addition product.[7]

To a fraction of sufficient range in boiling point and supposed to contain all of the carvone, is added one-fourth its volume of alcohol and a few drops of ammonia water. By passing hydrogen sulphide through this mixture the crystalline carvone hydrosulphide is precipitated, and may be weighed as such, or the carvone may be again liberated by saponification with alcoholic potash and then weighed.

III. By Hübl's iodine absorbtion method.[8]

The iodine factor of pure carvone is stated to be 103—110; that of limonene, with which carvone is associated in caraway oil, is much greater. A large iodine factor would therefore indicate a large percentage of limonene, i. e., a poor oil.

IV. By means of specific gravity.[9]

The specific gravity of carvone and of limonene are known, that of the former being greater than that of the latter. From the specific gravity of a mixture of the two, such as the volatile oil is supposed to represent, the ratio of mixture can be calculated.

V. By means of phenyl hydrazine.[10]

The oil is warmed with a weighed quantity of phenyl hydrazine and then filtered from the insoluble phenyl hydrazine condensation product of carvone. The unchanged phenyl hydrazine in the filtrate is oxidized by means of Fehling's solution, whereby the nitrogen is liberated as such and collected. From the volume of nitrogen the quantity of phenyl hydrazine in the filtrate may be calculated. The difference between this and the original quantity gives the amount of phenyl hydrazine which has combined with the carvone, and from this the amount of carvone can be readily calculated.

VI. By means of the rotatory power.

The rotatory power of these oils has also been taken advantage of in determining their purity or strength. The rotatory power of limonene is much greater than that of carvone.

Criticism of these methods.

I. Those familiar with the behavior of complex natural mixtures of substances such as the volatile oils almost always are, upon distillation, will know that only approximate results can be obtained by this method, even by working with comparatively large quantities. The oils containing carvone readily undergo changes upon distillation, leaving a very dark-colored residue, sometimes considerable in quantity. This cannot be entirely obviated even by distillation under greatly reduced pressure. Furthermore, whereas carvone is volatile with limonene vapor, some of the limonene is retained by the carvone. Complete separation is therefore only possible by repeated fractional distillation, but as already mentioned, decomposition takes place every time the carvone is distilled, so that there is considerable loss by the formation of dark residues. Wherever a sufficient amount of oil is at the disposal of the analyst and only approximate valuation is desired, this method has the advantage of simplicity.

II. This method is in so far superior to the first that it allows of the separation of the carvone in the form of a crystalline derivative. In addition to the length of time required, this method has several drawbacks: 1.) The precipitation of carvone as hydrosulphide is not quantitative. 2.) Some of the carvone is converted into thiocarvone and thiocarvone hydrosulphide.[4]

III. The objections that might be brought against the iodine absorbtion method are so numerous and so evident to anyone familiar with terpene literature that their discussion may be regarded as superfluous. The method as it is applied in general is utterly unscientific. As to its application to any of the carvone-containing oils, it may suffice to state that no one has ever studied the chemistry of the process.

IV. In regard to the fourth method attention must be called to the fact that the oils containing carvone do not consist simply of carvone and limonene, although other constituents have not been definitely isolated or identified. Furthermore, limonene, a constituent of several of the carvone-containing oils, polymerises and resinifies to a marked extent. A sample of limonene from erigeron oil that after repeated fractionation had been collected within the limit of a half degree in this laboratory about two years ago was again subjected to an examination. It was decidedly resinous in odor and appearance and was therefore purified by distillation with water vapor. About 30% of the total quantity was not volatile and was heavier than water. The distillate, when subjected to fractional distillation, boiled everywhere from 165° to 185°. This clearly shows that marked changes had taken place in the limonene, and it also shows that the specific gravity of a poor oil may increase on exposure to the air until it shows the specific gravity of a better oil. That the specific gravity is not always a criterion of purity or strength is also shown by the result of the examination of several commercial samples of caraway oil. As will be seen later, one oil in particular answered to the specific gravity and alcohol solubility tests of the U. S. P. and yet turned out to be a most worthless, although somewhat skillfully adulterated product.

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[1] Völckel, Annalen, 35, p. 308; Ibid., 85, p. 246. Gladstone, Chem. News, 24, p. 283.

[2] Jahresbericht der Chemie, 1863, p. 545.

[3] Ibidem, 1863, p. 545.

[4] Beyer, Archiv d. Pharm., 1883, p. 283.

[5] Chem. Zeit., 14, 1890, p. 1675; Arch. d. Pharm., 230, p. 285.

[6] Arch. d. Pharm., 1874, p. 324.

[7] Beyer, Arch. d. Pharm., 1883, p. 283.

[8] Jahresbericht d. Pharm., 1889, p. 363.

[9] Chem. Zeit., 1889 p. 1704. Proc. A. Ph. A., 1890, p. 587.

[10] Monatshefte f. Chemie, 1893, p. 270.

The angle of rotation of polarized light of these oils is even more unsatisfactory than the specific gravity. It has been repeatedly noticed in this laboratory that limonene is not constant in rotatory power. When freshly prepared its specific rotatory power is about 120°, but this gradually diminishes as it grows older, whereas the specific gravity increases at the same time. Some solvents also have an appreciable effect upon the rotatory power of limonene.*

V. This method is claimed to be applicable to both ketone and aldehyde constituents of volatile oils. It has been used with asserted good results in the estimation of bitter almond oil, cumin oil, and Spanish oil of rue.[10] Less satisfactory results were obtained in the estimation of the oils of cassia, caraway, fennel and lemon. The carvone content of the examined caraway oils (31.5%; 35.9%; 39.3%) is certainly too low for a good caraway oil which should contain about 45—50% of carvone. Aside from these facts the method presents some disadvantages in manipulation.

Of the five methods briefly reviewed two are based on physical constants, which, as has been shown, are not constant, because the substances of which they are characteristic undergo changes. Two are based on chemical reactions. One of these is not sufficiently quantitative to admit of accurate work, the other does not even obtain the endorsement of its advocates when it comes to the application of the general method to carvone-containing oils. Lastly, one of the methods is wholly unscientific, being based on reactions not at all clearly understood. A specific gravity determination; a determination of rotatory power; a test of solubility in alcohol, etc., are usually considered sufficient and are not without value particularly as preliminary tests. Although one or the other, or even several taken together may be misleading it is not probable that a poor or adulterated oil will satisfy all of these tests.

As a necessary consequence of the unreliability of the methods reviewed the information concerning the amount of carvone in volatile oils is on the whole unsatisfactory.

In 1874 R. Nietzki,[11] who made a chemical examination of dill oil, upon fractional distillation, obtained 30% of carvone, boiling between 225 and 230°.

Geissler[14] (1883) states that pure caraway oil contains 60 to 65% carvone and 30 to 35% "carvene".

A. Beyer[12] (1883) calls attention to the fact that German *Krauseminzöl* contains more carvone than American spearmint oil. "Wie Flückiges fand, gab von Schimmel & Co. dargestelltes roher deutsches Krauseminzöl, welches bei 50 mm. Rohrlänge einen Ablenkungswinkel von —21.4° zeigte, eine Ausbeute von 56%, während das amerikanische Spearmintöl, welches bei 50 mm eine Ablenkung von —18.2° zeigte, nur 35.5% lieferte."

Kremel[13] (1889), who evidently employed the iodine-method, claims to have found only about 30% of carvone in *Krauseminzöl.*

Nicolaysen[15] (1889) finds that although the Norwegian caraway seed yields a larger amount of oil than the Central European, that the former contains less carvone than the latter. The Norwegian oil upon fractional distillation yielded 48.9, 47.1 and 48% of carvone respectively, whereas the Central European oil according to the sp. gr. method was calculated to contain 64.5% of carvone and 35.5% of "carvene".

Experimental Part.

Goldschmidt has shown that carvone combines with hydroxylamine to form an oxime, which is relatively stable. Having had occasion to separate the ketone from the non-ketone constituents of caraway oil by means of the carvoxime reaction it was observed that the yield of carvoxime was about the same in different experiments conducted under similar conditions. This suggested the possibility of utilizing the carvoxime for the quantitative estimation of carvone. With this end in view samples of pure carvone and of pure limonene were prepared.

Preparation of pure carvone.

A quantity of caraway oil was fractionated under reduced pressure (30 mm.) and two fractions, one up to 110°, the other 110° to 125°, were collected. Fraction 110° to 125° was again subjected to fractional distillation under reduced pressure (30 mm.) and the fraction coming over between 120° to 123° was collected separately. This showed the specific gravity 0.957 at 20°, angle of rotation in 100 mm. tube +59° 7′ at the same temperature.

To this fraction was added ¼ its volume of alcohol and the mixture saturated with hydrogen sulphide; a small quantity of ammonia water was then added. The precipitated crystalline hydrosulphide of carvone was collected and washed with alcohol. The mother liquid was again saturated with hydrogen sulphide, when a second crop of crystals separated. This operation was repeated several times until no further precipitation took place. The yield amounted to 70%. The carvone hydrosulphide was recrystallized from a mixture of 3 parts chloroform and 1 part alcohol as suggested by Beyer. The angle of rotation of a 10% solution in chloroform was + 8°, sp. gr. 1.426 at 20°, hence $[\alpha]_D = +56.101^\circ$ and not +5.53° as reported by Beyer.

The carvone was regenerated by Beyer's method: 3 parts of hydrosulphide were treated with a cold solution of 1 part potassium hydrate in 20 parts of alcohol and allowed to stand three to four hours in the cold. This mixture was then poured into ten times its volume of water and the separated carvone collected and dried. The carvone was slightly yellowish in color and gave the following constants: specific gravity 0.959, angle of rotation +58° 47′, hence $[\alpha]_D = +61.19$.

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* Isomerieverhältnisse innerhalb der Terpenreihe, Inaugural-Dissertation: Göttingen, 1890, p. 81; also Am. Chem. Journ., 17, p. 692.

[10] Monatshefte f. Chemie, 1893, p. 270.

[11] Arch. d. Pharm. 204, p. 317.

[12] Ibidem, 221, p. 284.

[13] Jahresbericht d. Pharm., 1889, p. 363.

[14] Centralhalle, 1883, No. 21, p. 242.

[15] Chem. Zeit., 1889, p. 1704.

Upon distillation with water vapor the carvone came over perfectly colorless. The specific gravity of the dried oil was 0.96058 at 20°. In a 100 mm. tube it turned the plane of polarized light 60° 11′ to the right, hence $[\alpha]_D = +62.65°$.

How slight the changes in specific gravity and angle of rotation of the carvone in these several processes of purification were will become apparent from the following table.

	Sp. Gr. at 20°.	$[\alpha]_D$ at 20°.
Carvone obtained from caraway oil by fractional distillation under 30 mm. pressure............	0.957	+61.75°
Carvone regenerated from carvone hydrosulphide..................	0.959	+61.19°
The same, after distillation with water vapor and drying..........	0.96058*	+62.65°†

Preparation of pure limonene.

From the fraction —110° [30 mm. pressure] pure limonene was obtained by repeated fractional distillation.

A mixture, consisting of equal parts of pure carvone and pure limonene, was then prepared and its carvone content estimated by converting the ketone into carvoxime and weighing the latter. Several slight modifications of the same general process were tried with the object in view of obtaining as pure a carvoxime as possible.

Method I.

To a solution of 10 grams of the 50% carvone mixture in 25 cc. of alcohol, 5 grams of hydroxylamine hydrochlorate and 6.5 grams of sodium bicarbonate are added. This mixture was boiled in a flask connected with a reflux condenser for one hour. 25 cc. of water were then added and the alcohol was distilled off on a water-bath. Steam was then passed through the liquid very slowly, until no more oil or but very little oil came over with the aqueous distillate. The contents of the flask were allowed to cool and the solidified carvoxime removed from the flask, thrown upon a force filter, washed with water and dried by pressing upon a porous plate. When dry it was collected and weighed.

This method gave the following results with the 50% carvone mixture:

I. 5.346 grams carvoxime = 48.60% carvone.
II. 5.234 " " = 47.60% "
III. 5.280 " " = 48.00% "

There is a loss of about 2% according to this method, due to the fact that complete separation of the limonene from the carvoxime is not accomplished, so that when the soft carvoxime is spread upon the porous plate some of it is absorbed. To remedy this difficulty the following modification was tried.

Method II.

The only change made consisted in carrying the distillation farther than in the preceding experiments. Water vapor was passed through the oily liquid until traces of carvoxime appeared in the condenser. A more complete separation of the limonene was thus effected. The remaining carvoxime was dried on a force filter and weighed.

Ten grams of the carvone mixture yielded:

I. 5.640 grams carvoxime = 51.27% carvone.
II. 5.796 " " = 52.68% "
III. 5.971 " " = 54.27% "

Here the result is too high and variable, due greatly to the water enclosed by the carvoxime in solidifying, which evidently cannot be removed completely by simply drying in the air. By keeping it upon a water-bath for some time all the water may be driven off. In order to ascertain whether or not any loss of carvoxime was occasioned by this treatment the following experiment was made.

5.678 grams of carvoxime were heated for several hours on a boiling water-bath, weighings being made at intervals of one hour. The accompanying table gives a record of the weight of the carvoxime at the end of one, two, three etc. hours respectively, also the loss in weight observed in each case.

Weight of Carvoxime.	Loss.
5.678 grams.	
5.579 "	...............0.099 gram.
5.473 "	...............0.106 "
5.386 "	...............0.087 "
5.289 "	...............0.097 "
5.189 "	...............0.100 "

The loss of carvoxime by heating is therefore nearly a constant quantity, viz. about 0.100 gram per hour.

Method III.

The mixture of the alcoholic solution and the reagents was boiled upon the water-bath in a flask connected with a reflux condenser for half an hour. 25 cc. of water was then added and the alcohol, which carries over a large quantity of limonene, was distilled off from a water-bath. Steam was then passed through the liquid until traces of carvoxime came over. The last portions of the distillate were collected separately in test-tubes, and when traces of crystals of carvoxime appeared on the surface the operation was interrupted. The tube of the condenser was then washed with a little hot water and this, as well as the last collected distillate, containing some carvoxime, was returned to the flask. The contents of the flask were then allowed to cool and after the carvoxime had completely solidified it was removed from the sides of the flask by means of a loop of stiff wire, thrown upon a force filter, washed and dried by suction. The air-dried carvoxime was then transferred to a tared glass dish and heated for one hour on the water-bath, and when cool weighed. To the weight thus obtained 0.100 gram was added as this is about the quantity lost during heating. From the weight of the carvoxime that of the carvone may be readily calculated:

$$\underbrace{C_{10}H_{14}NOH}_{164.67}, \underbrace{C_{10}H_{14}O}_{149.66} = 1:0.9088$$

or, the weight of carvoxime expressed in grams when multiplied by 0.9088 gives the weight of the equivalent amount of carvone.

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* Determined with Sprengel's pycnometer, the others by means of the Mohr-Westphal balance.

† The tube was surrounded by a jacket through which a current of water at 20° was allowed to flow.

The 50% carvone mixture[16] gave by this method the following figures:

I. 5.525 grams carvoxime = 50.22% carvone.
II. 5.592 " " = 50.83% "
III. 5.579 " " = 50.71% "
IV. 5.503 " " = 50.00% "

From these figures it will be seen that the results obtained by this method come within one percent of the true carvone content.

Examination of Commercial Caraway Oils.

Several samples of commercial caraway oils were obtained and examined. In the subjoined table the results are arranged for ready comparison.

Commercial Caraway Oils, examined by method II.[17]

	Specific gravity at 20°.		Angle of rotation in a 100 mm tube at 20°.		Carvone content.		Description of carvoxime.		Not volatile with water-vapor.
	Before purification.	After purification.	Before purification.	After purification.	Before purification.	After purification.	Before purification.	After purification.	
1.	0.921		+70° 36′		54.21% 54.00%		Good condition.		
2.	0.909		+77° 4′		47.82% 48.25%		Good condition.		
3.	0.910	0.884	+15° 45′	+18° 39′	?	?	Oily and resinous.	Oily.	13%
4.	0.912	0.894	+68° 41′	+75° 46′	47.38%	41.75%*	Soft, slightly resinous.	Nicely crystalline.	6.5%
5.	0.934	0.897	+66° 15′	+79° 37′	52.65%	46.80%*	Soft and resinous.	Nicely crystalline.	8%
6.	0.895	0.888	+50° 46′	+52° 12′	33.45%	33.65%*	Good condition.	Nicely crystalline.	Slight.

Samples 1 and 2 were remnants from larger quantities that had been used in this laboratory, the others were obtained from different pharmacists. In the case of the purchased oils the resulting carvoxime was so resinous that the oils had to be redistilled with water vapor before an accurate determination could be made. Three of the oils left a considerable residue not volatile with water vapor which therefore had remained with the carvoxime obtained before distillation, increasing it in amount and thus showing a higher carvone content than was found after purification of the oil. In the examination of commercial caraway oil which has become colored or resinified it is therefore always necessary to redistill with water-vapor; otherwise the carvone content will be found to be higher than it really is. The character of the carvoxime, which consists of a colorless crystalline mass when pure, readily reveals the presence of such impurities. Upon purification the specific gravity in all cases decreased, while the rotatory power was increased.

Sample number 4 is interesting, as it had been for at least 20 years upon the shelf of an old pharmacy. It possessed a strong caraway odor, but not as pleasant as that of more recent oils. It was very dark in color, and the nonvolatile residue left upon steam distillation showed that changes had taken place in the oil. By purification the specific gravity was decreased from 0.912 to 0.898 and the angle of rotation increased from 68° 41′ to 75° 46′. The non-ketone constituent distilled from the oxime showed a rotation of 89° 14′. The other samples, with the exception of number 3, may be passed over without further comment.

Number 3 is highly interesting in that it proved to be a grossly though somewhat skillfully adulterated product. This oil was dark in color and possessed a terebinthinate odor. In specific gravity and alcohol solubility it responded to U. S. P. requirements. In optical activity, however, it showed the remarkably low rotation of 15° 45′. A carvone determination was undertaken, but the carvoxime, if such, was so resinous that it would not solidify. The water was poured off and the flask with contents dried and weighed. The weight of the contents was 2.450 gram.

The oil was then distilled with water-vapor and a residue amounting to 13% was left in the flask. The colorless distillate showed the specific gravity 0.884 and an angle of rotation of 18° 39′ at 20°. A carvone determination was made, but it was no more satisfactory than that before purification. The impure carvoxime, if such at all, was oily and had to be weighed with the flask. It had the insignificant weight of 0.554 gram,

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[16] When more carvone is present a larger quantity of hydroxylamine must be used.

* When estimated according to method III No. 4 revealed a carvone content of 42.86% and 42.04%; No. 5 one of 43.29% and 43.38% and No. 6 one of 30.95% and 31.19% respectively, duplicate estimations being made in each case.

In order to make a more thorough examination of the oil, a larger quantity was treated with hydroxylamine and distilled with water-vapor in order to separate the traces of ketone constituent. The distillate showed the specific gravity 0.867 and the angle of rotation was 14° 38′ at 20°. It was subjected to fractional distillation with the following results:

—— –158°	11.0 cc.
158°–159°	10.5 cc.
159°–160°	6.5 cc.
160°–162°	5.0 cc.
162°–164°	3.2 cc.
164°–167°	1.8 cc.
167°–170°	0.6 cc.
170°–175°	1.4 cc.
175°–190°	1.5 cc.

From fraction 158°–159° a nitrosochloride was prepared. The yield was about 30%. It melted at from 105°–106°. By treating this with alcoholic potash an oxime was obtained which, after purification, melted at 129°–130°. By treating another portion of the nitrosochloride with benzylamine, the nitrolbenzylamine base was obtained and purified by crystallization from a mixture of alcohol and ether. The purified benzylamine base melted at from 122°–123°.

These facts show conclusively that the oil under consideration consisted chiefly of pinene. The high specific gravity of the oil is easily accounted for by the presence of the nonvolatile resinous substance. This would also increase the alcohol solubility of the adulterated oil, whereas the presence of large amounts of pinene would tend to decrease the solubility in alcohol.

Examination of Commercial Spearmint Oils.

Only two samples were examined and the carvone content estimated by method I. The results are arranged in a table for better comparison. Sample number 1 was soluble in an equal volume of alcohol but became turbid on further dilution. It was soluble in glacial acetic acid in all proportions and was soluble in three parts of carbon disulphide; beyond this point it became turbid.

Commercial spearmint oils, examined by method I.[17]

		Sp. Gr. at 20°.	α in a 100 mm tube at 20°.	Carvone content.	Description of carvoxime.
1.	Not purified.	0.935		62.41% 64.00%	Soft and resinous.
2.	Before purification.	0.942	—46° 27′	57.63% 58.59%	Solidified with difficulty.
	After purification.	0.933	—47° 45′	59.68%	Nicely crystalline.

Sample number 2 was also soluble in an equal volume of alcohol, becoming turbid on further addition of alcohol. After purification, however, it was soluble in alcohol, in carbon disulphide, and in glacial acetic acid in all proportions.

This method for the estimation the carvone content of volatile oils by means of carvoxime certainly meets the requirements of a thoroughly scientific process of assay. Although the estimation is not absolutely perfect, yet the results are surprisingly good for such complex mixtures as volatile oils are. The fact that a poor oil, rich in nonvolatile constituents, gives no good results directly, but must be rectified, is not so much a disadvantage as it is a point in favor of this method.

It may be objected that the method though highly satisfactory when compared with others is too scientific and not sufficiently practical. In reply to such an objection attention may be called to the fact that 99% of the druggists will no more employ the boiling point method, though eminently simple, than the carvoxime method. On the other hand those who possess the requisite knowledge and skill will not only find this method more accurate, and therefore more satisfactory, but even simple when compared with other processes of pharmacopœial assay. The small amount of oil that suffices to afford good results certainly is a strong point in favor of the carvoxime method.

This process is now being further tested with regard to its application to the assay of more skillfully adulterated oils. The test will also be made whether students with but a very moderate experience in drug assaying can use the method to advantage.

Pharm.-Chem. Laboratory,
University of Wisconsin.

Medicinal Plants of Brazil.*

By *Dr. Theodor Peckolt of Rio de Janeiro.*

Nyctaginaceæ.—Continued.

Pisonia aculeata L. In den Staaten S. Paulo, Minas und Rio de Janeiro. Bekannt als *Cipo molle* — Weiche Liane.

Ein bis zwei Meter hoher, dorniger Strauch mit gegenständigen, länglich ovalen, stumpflichen, hellgrünen Blättern. Blüthenstand achselständig, in Corymben, mit zweigeschlechtlichen, kleinen,

Pisonia aculeata L. In the states S. Paulo, Minas and Rio de Janeiro. Known as *Cipo molle*, soft liana.

A thorny shrub reaching a height of two meters with opposite, oval-oblong, blunt, bright green leaves. Inflorescence, axillary corymbs with small greenish-yellow, bisexual, weakly-fragrant

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[17] These oils were estimated before method III had been devised. The caraway oils, 4, 5 and 6 were again estimated by method III.

* Continued from p. 51. Translated for the Review by Dr. R. H. True, instructor in pharmacognosy at the University of Wisconsin.

grünlichgelben Blüthen von schwachem Wohlgeruch. Die Frucht eine Caryopse, mit kleinen krummen Stacheln bekleidet, wird von den Vögeln sehr gesucht.

Ein Extract der Früchte dient als Insektenleim. Das Decoct der Blätter ist ein beliebtes Volksmittel zur Heilung des Trippers.

Pisonia subcordata Sw. An den sandigen Küstenstrecken der tropischen Staaten von Rio de Janeiro bis zum Staate Alagoas. Bekannt als *Ramalhete do mato* — Waldblumenstrauss, im Norden als Paó mondé — Zahnstocherbaum.

Ein ansehnlicher Baum mit zwei- und dreigabelig verzweigten Aesten, und mit gegenständigen, herzförmig ovalen oder länglich ellyptischen, stumpflich zugespitzten Blättern. Blüthenstand in grossen Trugdolden mit diœcischen, hellgrünen Blüthen und rothen Blüthenstielen.

Das weisse Holz lässt sich leicht spalten und wird zu den verschiedensten häuslichen Utensilien benutzt, ferner zu Zaunpfählen etc. Das Decoct der Rinde wird zu Bädern bei Geschwulst der Füsse gebraucht, auch als Waschwasser zur Reinigung alter Wunden.

Zu gleichem Zwecke wird benutzt der im Staate Pernambuco vorkommende baumartige Strauch *Pisonia cordifolia* Mart., welcher unter dem Volksnamen *Ciomichá* bekannt ist.

Pisonia pubescens H., B., & Kth. In dem Staate Rio de Janeiro nördlich bis Bahia. Bekannt als *Gerimú* und *Paó gerimú*.

Ein vier bis fünf Meter hohes Bäumchen mit dichotomischen knotigen Aesten und verkehrt eiförmig-länglichen, kurz zugespitzten Blättern, welche oberseits glänzend dunkelgrün, unterseits rostfarben filzig sind. Die Dolden sind traubige Trugdolden mit grünen Blüthen.

Die Rinde des Baumes ist rothgelb, ähnlich der Jerumu-kürbissschale — deshalb die Benennung — und wird als Adstringens benutzt. Das Holz wird zum Häuserbau, vorzugsweise zu Dachsparren und Schindeln, sowie zu verschiedenen häuslichen Geräthschaften verwandt.

Pisonia alcalinia Fr. Allem. Kommt vor im Staate Cearà und ist unter den Volksnamen *Mangue branco* — Weisser Mangle und *Tapaceriba branco* bekannt.

Ein kleiner, dem Mangle ähnlicher Strauch. Die frische Wurzel in der Dosis von sechs Gramm wirkt brechenerregend und abführend. Getrocknet soll dieselbe nur abführend wirken. Bei chronischer Bronchitis, Gelbsucht etc. wird sie benutzt.

Pisonia Olfersiana Link. Im Staate Rio de Janeiro, am Flusse Rio Negro bei Cantagallo ziemlich häufig.

Ein kleines elegantes Bäumchen mit armesdickem Stamme und 44 ctm. langen lancettlichen Blättern. Der Blüthenstand ist eine faustgrosse, rundliche Trugdolde mit wohlriechenden, perlenähnlichen, fleischroth glänzenden Blüthen; deshalb die Benennung: *Flor de perolas* — Perlenblüthe.

Die fleischige bräunlichrothe Wurzelrinde dient als mildwirkendes Abführmittel und zwar 30 Gramm zu 300 Gramm Decoct in drei Dosen stündlich genommen.

Pisonia tomentosa Casar. Auf den steinigen Hochebenen des Camposgebietes der Staaten S. Paulo, Minas, Bahia und Goyaz. Bekannt als *Paó lepra* — Aussatzbaum; *Paó Judeo* — Judenbaum; *João molle* — Weicher Johann.

Ein schöner bis acht Meter hoher Baum mit verschieden gedrehten knorrigen Aesten. Die jün-

flowers. The fruit, a caryopsis covered with small crooked prickles, is much sought by birds.

An extract of the fruits furnishes insect lime. The decoction of the leaves is a favorite popular remedy for gonorrhoea.

Pisonia subcordata Sw. Along the sandy coast regions of the tropical states from Rio de Janeiro to the state Alagoas. Known as *Ramalhete do mato* — forest-flower nosegay, in the north as *Paó mondé* — toothpick tree.

A considerable tree with twice or thrice forking branches, and with opposite, oval-cordate or oblong-elliptical, bluntly-pointed leaves. Inflorescence, large dichotomous cymes with bright green diœcious flowers and red peduncles.

The white, easily split wood is used for the most various household utensils, also for fence posts etc. The decoction of the bark is used for bathing also as a wash for cleansing old wounds.

For the same purpose, the tree-like shrub *Pisonia cordifolia*, Mart. is used. This plant occurs in the state of Pernambuco and is popularly called *Ciomichá*.

Pisonia pubescens H., B., & Kth. In the state Rio de Janeiro northward as far as Bahia. Is called *Gerimú* and *Paó gerimú*.

A small tree four to five meters high with dichotomous, knotty branches and ob-lanceolate-ovate, short pointed leaves which on the upper side are shining, dark-green, beneath rusty tomentose. The cymes are racemous with green flowers.

The bark of the tree is reddish-yellow resembling the Jerumu gourd — hence the name — and is used as an astringent. The wood is used in house-building, mainly as rafters and shingles; also is made into different household utensils.

Pisonia alcalinia Fr. Allem. Occurs in the state Cearà and is known among the people by the names, *Mangue branco*, white mangle, and *Tapaceriba branco*.

A small shrub resembling the mangle. The fresh root in a dose of six grams acts as an emetic and cathartic; when dried it is said to act only as a purgative. It is used in chronic bronchitis, jaundice etc.

Pisonia Olfersiana Link. Quite abundant in the state Rio de Janeiro on the Rio Negro River near Cantagallo.

A small, graceful tree with a stem of the thickness of the arm, and long lanceolate leaves of 44 ctm. length. The inflorescence is a roundish cyme of the size of the fist with fragrant pearly flesh-colored, shining flowers, hence the name, *Flor de perolas*, pearl flower.

The fleshy, brownish-red bark of the root is used as a mild purgative. A decoction of 30 grams to 300 grams is taken in three doses per hour.

Pisonia tomentosa Casar. On the stony uplands of the Campos region of the states S. Paulo, Minas, Bahia and Goyaz. Known as *Paó lepra*, leprosy tree; *Paó Judeo*, Jew's tree; *João molle*, soft John.

A fine tree reaching a height of eight meters with knotty branches variously twisted. The geren Aeste sind mit rostfarbenem Filze bedeckt. Die Blätter sind länglich-oval, bauschig-runzelig, oberseits dunkelgrün, unterseits gelb, roth befilzt. Der Blüthenstand ist eine achselständige schirmförmige Scheindolde.

Diese sowohl als auch die kleinen männlichen und weiblichen Blüthen sind mit einem fuchsrothen Filze dicht bekleidet. Der filzige Ueberzug der Pflanze soll bei Berührung auf der blossen Haut starkes Jucken und knotiges Enzem verursachen; deshalb die erste Benennung. Die letzte Benennung kommt dem Baume von wegen des weichen Holzes zu. Weshalb derselbe Judenbaum benannt wird, darüber konnte ich keine Aufklärung erhalten.

Das Holz ist leicht schneidbar und werden Löffel davon geschnitzt. Es ist weiss, wird aber nach kurzer Zeit schwarzgrau. Das Decoct der Blätter dient zum schwarzviolett färben baumwollener Zeuge. Die Blätter sowohl als auch die Rinde sind energisches Adstringens.

Neea theifera Oersted. (Fig. 1.) Auf dem Camposgebiet der Staaten Minas, Goyaz und Matto Grosso.

Ein Strauch, welcher eine Höhe von drei Meter erreicht, mit hin- und hergewundenem Stamm von acht bis zehn Ctm. Durchmesser und hellbrauner, glänzender, korkartiger, rissiger Rinde. Die Blätter sind ganzrandig, länglich, stumpfzugespitzt, am Grunde kaum bemerkbar herzförmig. Der Blüthenstand ist eine aufrechte Rispe mit diœcischen, kleinen, rosarothen Blüthen.

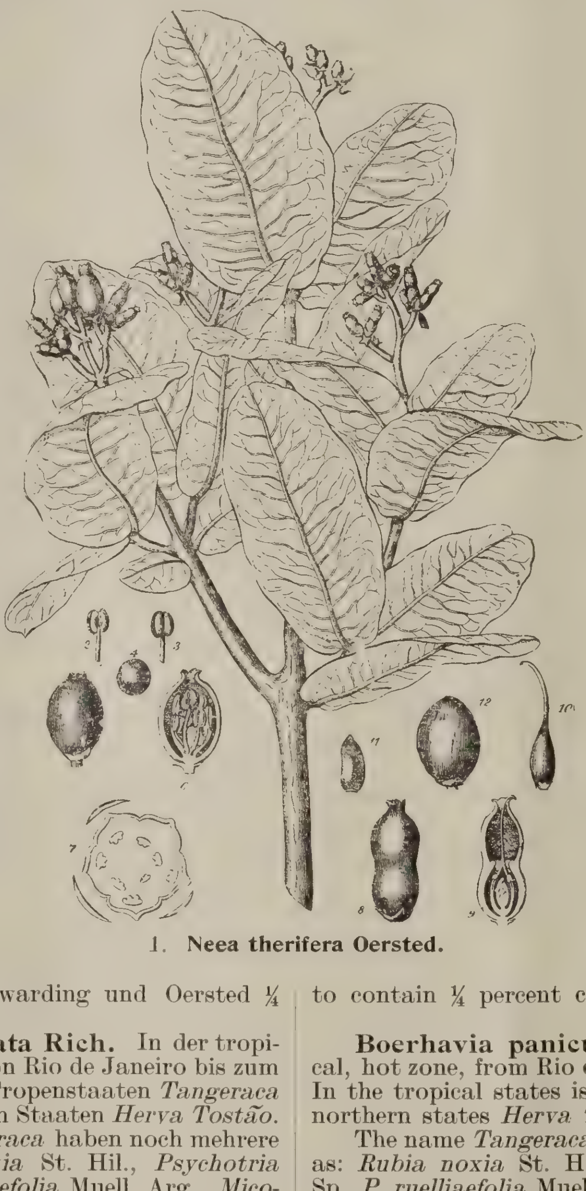
Die Blätter werden zum Schwarzfärben baumwollener Zeuge benutzt, deshalb die Benennung *Caparrosa*— Eisenvitriol. Der Aufguss der trockenen Blätter wird vom Volke als Ersatz des indischen Thees getrunken; dieselben sollen nach Schwarding und Oersted ¼ Procent Coffein enthalten.

Boerhavia paniculata Rich. In der tropischen und heissen Zone, von Rio de Janeiro bis zum Aequator. Wird in den Tropenstaaten *Tangeraca* benannt, in den nördlichen Staaten *Herva Tostão.*

Die Benennung *Tangeraca* haben noch mehrere Pflanzen, als: *Rubia noxia* St. Hil., *Psychotria Marcgravii* Sp., *P. ruelliaefolia* Muell. Arg., *Miconia guianensis* Cogn., *Eclinta palustris* Vellos.

Kriechend strauchartige Pflanze mit sehr langgestielten, ungetheilten, oval-gerundeten, gewimperten Blättern. Die Blüthenrispe mit sehr kleinen purpurrothen Blüthen.

Die neuen Blätter werden als Gemüse genossen, die Wurzel als blutreinigendes und harntreibendes Mittel eingenommen.



1. **Neea therifera Oersted.**

younger branches are covered with a rusty tomentum. The leaves are oval-oblong, rugose, above dark-green, beneath, yellow, tomentose. The inflorescence is an umbrella-shaped false cyme.

This as well as the small male and female flowers are clothed with a dense, fox-red tomentum. The tomentum of this plant on contact with the bare skin is said to cause a strong itching sensation and nodular swellings, hence the first name. The last name is given to the tree on account of its soft wood. Why it is called the Jews tree remains unexplained.

The wood is easily cut and spoons are carved from it. It is white, in time becoming, however, blackish-gray. The decoction of the leaves serves to dye cotton fabrics a blackish-violet. The leaves as well as the bark act as strong astringents.

Neea theifera Oersted. (Fig. 1.) In the Campos region of the states of Minas, Goyaz and Matto Grosso.

A shrub attaining a height of three meters, with a zig-zag winding stem of eight to ten ctm. diameter, with light-brown, shining, corky, fissured bark. The leaves are entire, oblong, bluntly pointed, at the base hardly perceptibly cordate. The inflorescence is an upright panicle with small, diœcious, rose-red flowers.

The leaves are used to stain cotton fabrics black, hence the name *Caparrosa,* iron-vitriol. The infusion of the dried leaves is used as a substitute for Indian tea; the leaves are said by Schwarding and Oersted to contain ¼ percent caffein.

Boerhavia paniculata Rich. In the tropical, hot zone, from Rio de Janeiro to the equator. In the tropical states is called *Tangeraca,* in the northern states *Herva Tostão.*

The name *Tangeraca* is shared by many plants, as: *Rubia noxia* St. Hil., *Psychotria Marcgravii* Sp., *P. ruelliaefolia* Muell. Arg., *Miconia guianensis* Cogn., *Eclinta palustris* Vellos.

Shrubby, creeping plants with very long-petioled, undivided, oval-rounded, ciliate leaves. The floral panicle with very small purple-red flowers.

The new leaves are eaten as "greens." The root is used as a blood purifier and diuretic.

Boerhavia hirsuta Willd. (Fig. 2.) Vom Staate S. Paulo nördlich bis zum Aequator. Besonders häufig in den Staaten Minas und Rio de Janeiro. Kommt vor als Unkraut auf kultivirten Ländereien, wird aber auch oft in den Gärten kultivirt.

Im Staate Pernambuco heisst es *Bredo de porco* — Schweins Amaranth; in Bahia und Alagoas: *Pega pinto* — Küchleinklette, in Ceará und Sergipe: *Papo de perú* — Truthahnkropf; hier und den anderen Staaten: *Herva de tostão* — Hundertreiskraut.

Eine krautartige, kriechende, rauhhaarige Pflanze mit kurzgestielten, gegenständigen, länglich-ovalen, etwas spitzen, kurzhaarigen Blättern. Der Blüthenstand besteht in einem ausgepreitzten, laxen Rispchen mit sehr kleinen rothen Blüthen. Die Frucht ist keulenförmig, drüsig-klebrig, höchstens zwei Millimeter lang.

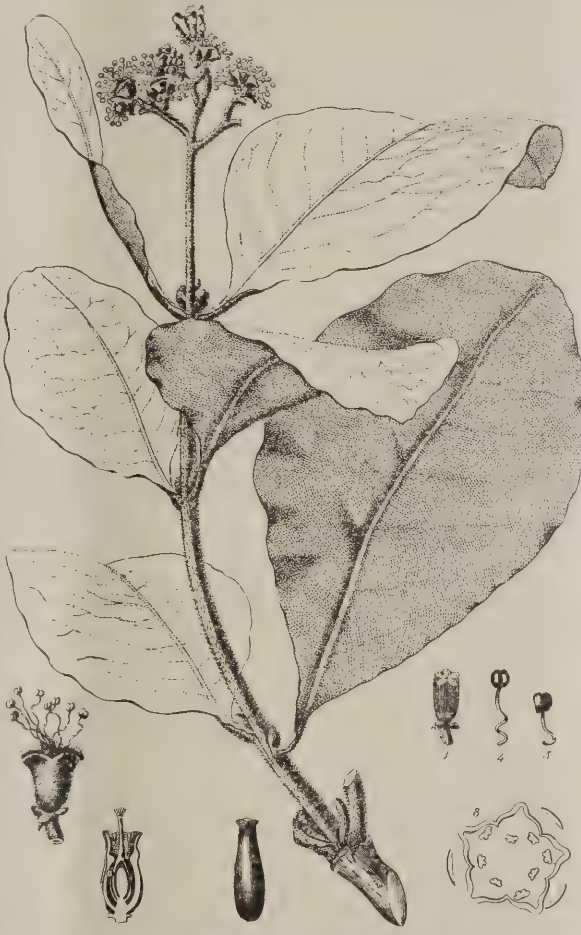
Die Pflanze ist ein Universalheilmittel der Brasilianer und fehlt in keiner Haushaltung, auch wird dieselbe vielfach von Aerzten verschrieben. Der Saft der frischen ausgepressten Blätter dient zur Kräuterkur. Des Morgens wird eine kleine Tasse voll getrunken bei Leberverhärtung, Unterleibsstockung und Gelbsucht.

Einige Autoren geben an, dass die jungen Blätter als Gemüse genossen werden, welches ohnstreitig eine Verwechselung mit *B. paniculata* ist; es geschieht nie, da die jungen Blätter noch rauhhaariger als die älteren und nicht geniessbar sind.

Das am meisten geschätzte Heilmittel ist die Wurzel. Oken, Rosenthal und andere bezeichnen dieselbe als Brech- und Abführmittel, was durchaus nicht der Fall ist. Kein hiesiger Arzt hat diese Wirkung beobachtet. Ich habe ein concentrirtes Decoct getrunken und nur starke harntreibende Wirkung beobachten können.

Die Aerzte verordnen am häufigsten das Decoct, seltener das Pulver und Extract. Es gilt als desobstruens und diureticum. Es wird angewandt bei Milzaffectionen zufolge der Sumpffieber, bei gastrischbiliösen Fiebern, Gallenkolik und Gelbsucht, Nieren- und Harnblasenaffectionen, Hämorrhoidalbeschwerden und vorzugsweise bei Leberaffectionen.

Das Decoct von 12 Grm. Wurzel zu 360 Grm. Colatur wird Kelchglasweise dreistündlich eingenommen; öfters auch ein Decoct aus 60 Grm. zu 720 Grm. Colatur. Die officinelle *Tisana desobstruente* besteht aus *Decoctum Radicis Boerhaviae* 500 Grm., mit *Tartarus boraxatus* 10 Grm., *Natrium bicarbonicum* 4 Grm., *Syrupus aperientes* 30 Grm.



2. **Boerhavia hirsuta Willd.**

Boerhavia hirsuta Willd. (Fig. 2.) From the state of S. Paulo northward to the equator. Especially abundant in the states Minas and Rio de Janeiro. Occurs as a weed in cultivated lands, often also cultivated in the gardens.

In the state of Pernambuco it is called *Bredo de porco* — swine's amaranth; in Bahia and Alagoas: *Pega pinto* — chicken-bur; in Ceará and Sergipe: *Papo de perú* — turkey-crop; here and in the remaining states, *Herva de tostão* — Hundred-branch plant.

An herbacious, creeping, roughly pubescent plant with short-petioled, opposite, oval-oblong, somewhat pointed leaves with short pubescence. The inflorescence is a spreading, divaricate, lax panicle with very small, red flowers. The fruit is clavate, clammy-glandular, at the most two millimeters long.

The plant is a universal remedy among the Brazilians and is lacking in no household; it is also much prescribed by physicians. The sap pressed from the fresh leaves is used in the herb cure. A small cupful is taken in the morning for induration of the liver, intestinal stoppage and jaundice.

Some authors state that the young leaves are used as "greens," but there is undoubtedly a confusion with *B. paniculata,* since the young leaves are still more roughly pubescent than the older and are not edible.

The most highly prized remedy is the root. Oken, Rosenthal and others class it as emetic and purgative, — a mistake, since no physician here has observed this action. I have drunk a concentrated decoction and could notice only a strongly diuretic action.

The physicians prescribe most commonly the decoction, more rarely the powder and the extract. It acts as deobstruent and diuretic. It is administered in splenic affections following the swamp fever, in gastric-bilious fevers, calculary colic and jaundice, kidney and bladder complaints, hemorrhoidal troubles and especially for liver affections.

A wineglassful of the decoction from 12 grm. of the root to 360 grm. of the colature is taken every three hours; frequently also a decoction from 60 grm. of the root to 720 grm. of the colature is used. The official *Tisana desobstruente* consists of *Decoctum Radicis Boerhaviae,* 500 grm., with *Tartarus boraxatus,* 10 grm., *Natrium bicarbonicum,* 4 grm., *Syrupus aperientes,* 30 grm.

Von diesem Präparat wird zweistündlich ein Kelchglas voll genommen.

Das Extract wird in der Dosis von 0.1 Grm. mit Wurzelpulver in Pillenform verschrieben. Bei Convulsionen der Kinder, verursacht durch Wurmreiz, werden 0.2 bis 0.4 Grm. Wurzelpulver mit *Jetahy* honig gemischt, dreimal täglich gegeben.

Bei Schlangenbiss, wenn die Pflanze in der Nähe, wird eine Wurzel gekaut und genossen, eine zweite gekaute Wurzel auf die Bisswunde gebunden. Zu Hause angekommen werden vier bis fünf Wurzeln mit einer halben Flasche Zuckerbranntwein angestossen, ausgepresst und alle Viertelstunde ein Liquörglas voll getrunken. Die ausgepresste Wurzel, mit etwas Wasser angerührt, wird als Umschlag auf die Bisswunde gebunden.

Die Wurzeln sind rübenförmig, mit brauner Epidermis, sehr spitz endend und am Ende mit feinen hellbräunlichen Wurzelfasern besetzt. Die dickeren Wurzeln sind sechs bis zwölf Ctm. lang und haben am oberen Theil einen Durchmesser von 25 Millimeter. Die dünneren Wurzeln sind 25 Ctm. lang und oben nur 12 Millimeter dick. Das Mark ist weiss. Gekaut besitzen dieselben einen unangenehm salzigen Geschmack und verursachen ein belästigendes Jucken auf der Zunge.

Die frischen und getrockneten Wurzeln wurden untersucht, doch konnte weder durch Ausschütteln noch durch anderweitige Processe ein krystallinisches Product erhalten werden. Durch Ausschüttelung mit Amylalcohol wurde eine amorphe bitterschmeckende Substanz erhalten, welche nur in Amylalcohol, Alcohol und Wasser löslich war. Mit Mayer's Reagens gab die Lösung ein voluminöses Präcipitat, mit anderen Alkoloidreagentien und mit Gerbsäure jedoch keine Reaction.

In der frischen Wurzel wurden gefunden:

Wasser	47.241	Procent.
Fettes Oel	0.252	"
Eiweiss	0.300	"
Stärkemehl	15.800	"
Zucker	1.000	"
Bitterstoff	0.579	"
Harzsäure	0.173	"
Extract etc	3.950	"
Asche	8.620	"

Das fette Oel ist dickflüssig, gelbbraun, geruchlos, von widerlich unangenehmen kratzenden Geschmack. Mit Schwefelsäure färbt es sich dunkelbraun und wird schmierig und klebend, während die Säure farblos bleibt. Die Harzsäure ist geruch- und geschmacklos, nur löslich in Alcohol und Ammoniak.

In den Staaten Minas und Goyaz wird als *Herva tostão* die *Boerhavia erecta* L. benutzt.

Andradea floribunda Allem. Im Staate Rio de Janeiro. Heisst *Battam* und *Tapaceriba amarella*,

Ein hoher Baum mit dickem Stamm und grauer, korkartiger, rissiger Rinde. Die Blätter sind ganz randig, länglich-oval, zugespitzt, oberseits dunkelgrün, unterseits grauweiss befilzt. Blüthenstand endständig und zwar eine reichblühende, prachtvolle Rispe mit grünlich-weissen, sammtartig befilzten Blüthen. Die Frucht ist nussartig mit kleinen braunen Samen. Das feste violett-röthliche Holz ist ein vorzügliches Bauholz und wird auch zu Möbeln benutzt, während die Sägesspäne zum Färben der baumwollenen Zeuge Anwendung findet,

Andradea dulcis Allem. Im Staate Para heisst dieselbe *Casca doce* — Süsse Rinde.

A glassful of this preparation is taken every two hours.

The extract is given in a dose of 0.1 grm. made into pills with the powder of the root. In convulsions in children caused by irritation from worms, 0.2 to 0.4 grm. of the powdered root is mixed with *Jetahy* honey and given three times daily.

In snake bite, if a plant can be found near by, a root is chewed and swallowed, a second is chewed and bound to the wound. On arriving at home, four or five roots are crushed in half a bottle of sugar brandy and the juice expressed; a liquorglass full being taken every quarter-hour. The root-pulp is then stirred with water and bound to the wound.

The roots are turnip-shaped, with brown epidermis, ending very pointedly and at the end covered with fine, light-brownish, fibrous roots. The thicker roots are six to twelve ctm. long, and have in the upper part a diameter of 25 mm. The thinner roots are 25 ctm. long with a diameter above of only 12 mm. The pith is white. When chewed, they have an unpleasant saline taste and cause an annoying itching of the tongue.

The fresh and the dried roots were investigated, but neither by shaking nor by any other process could a crystalline product be obtained. By shaking with amylalcohol, an amorphous, bitter tasting substance was yielded, soluble only in amylalcohol, alcohol and water. With Mayer's reagent, the solution gave a voluminous precipitate; with other alkaloid reagents and with tannic acid, no reaction was observed.

In the fresh root was found the following:

Water	47.241	Percent.
Fatty oil	0.252	"
Proteid	0.300	"
Starch	15.800	"
Sugar	1.000	"
Bitter principle	0.579	"
Resin acid	0.173	"
Extract etc	3.950	"
Ash	8.620	"

The fatty oil is thick, yellowish-brown, odorless with a repulsively unpleasant, rough taste. With sulphuric acid, it takes on a dark-brown color, becoming smeary and sticky while the acid remains colorless. The resin acid is odorless and tastless, soluble only in alcohol and ammonia.

In the states Minas and Goyaz, *Boerhavia erecta* L. is used as *Herva tostão*.

Andradea floribunda Allem. In the state Rio de Janeiro. Is called *Battam* and *Taperceriba amarella*.

A tall tree with thick stem and gray, corky, much fissured bark. The leaves are entire, oval-oblong, acuminate, on the upper side dark green, below grayish-white, tomentose. Inflorescence terminal, a richly flowering, showy panicle with greenish-white, velvety-pubescent flowers. The fruit is nut-like with small, brown seeds. The firm, reddish-violet wood is an excellent building material and is also used for furniture. The sawdust is used as a dye for coloring cotton fabrics.

Andradea dulcis Allem. In the state Para, is called *Casca doce* — sweet bark.

Ein grosser Urwaldbaum, welcher ebenfalls gutes Bauholz liefert. Die Rinde wird wie *Monesia*rinde benutzt, soll auch zur Verfälshung derselben angewandt werden.

A large tree of the primeval forests which likewise furnishes good building timber. The bark is used as *Monesia* bark, and is said to be used for the adulteration of the same.

Notes on Bismuth Subgallate and Subtannate.

By *Ferd. A. Sieker.*

About one year ago the writer published[1] two methods for preparing bismuth subgallate. One method consisted in precipitating a solution of bismuth nitrate in nitric acid and water with a warm aqueous solution of gallic acid. The other method was by the action of gallic acid on bismuth subnitrate in the presence of water at 50° C.

The latter method was recommended for its simplicity and the lightness of the resulting salt. Experience has shown, however, that all bismuth subnitrates are not adapted for this method, some forming a product not entirely soluble in a solution of sodium hydroxid and therefore containing uncombined oxid. That commercial bismuth subnitrates vary considerable in composition has again been recently shown by Prof. Curtman.[2] Bismuth subnitrates assaying a high percent of Bi_2O_3 will not form a pure subgallate; in the writers experience a salt assaying about 80% will generally form a pure subgallate, but there are exceptions to this rule. To illustrate, four samples of subnitrate assaying 79.9, 79.9, 80.3 and 80.4% of Bi_2O_3 respectively, yielded subgallates that were perfectly soluble in a solution of sodium hydroxid while another sample assaying 80.2% of Bi_2O_3 yielded a subgallate which was not perfectly soluble. The percent of acid present in the subnitrates mentioned above was not determined, but Prof. Curtman has shown that two samples assaying the same percentage of Bi_2O_3 do not necessarily contain the same quantity of nitric acid. This variation may be caused by the extent of dilution of the solution used for precipitation, the extent to which it is neutralized during precipitation, the temperature, the amount of water used in washing and probably to other causes.

In selecting a subnitrate for preparing the subgallate determine the percent of Bi_2O_3, and if it assays about 80%, treat a small quantity with six times its weight of water and 0.81 times as much gallic acid as there is Bi_2O_3 in the quantity of subnitrate employed. Instead of heating to 50° C., as recommended a year ago, heat to about 60 to 65° C. for several hours. If the product of the reaction is perfectly soluble in a solution of sodium hydroxid the subnitrate is acceptable for the purpose.

As stated a year ago this method yields a voluminous impalpable powder which possesses certain advantages over a heavier salt such as results when preparing it by direct precipitation.

A third and very simple method may be mentioned which consists in treating 466 parts of powdered normal bismuth nitrate, $Bi(NO_3)_3+H_2O$, with a warm (40° C.) solution of 188 parts of gallic acid in 4000 parts of water. The resulting subgallate possesses a beautiful yellow color and is perfectly soluble in a solution of sodium hydroxid (compare bismuth subtannate).

In preparing bismuth subgallate according to any of the processes mentioned above it should be rapidly washed until the washings no longer redden blue litmus paper. If the washing is carried further decomposition slowly sets in.

Bismuth Subtannate.

A chemical formula for this salt does not appear to have been published. The formula $C_{14}H_9O_9Bi(OH)_2$ requires 41.5% of Bi_2O_3 but as tannic (digallic) acid is a monobasic pentoxyacid we may expect a salt of the composition, $C_{14}H_7O_9Bi$ which if anhydrous would require 44.17% of Bi_2O_3 and with two molecules of water of crystallization 41.50% of Bi_2O_3.

Richter in his Organic Chemistry (2nd edition by Prof. Smith) states that tannic acid "generally forms salts with two equivalents of metal; these are obtained pure with difficulty." Roscoe and Schorlemmer in their Treatise on Chemistry (Vol. III, part IV, page 374) state that tannin "is a monobasic, the salts of which are amorphous and difficult to prepare pure." E. Schmidt in his Pharmaceutische Chemie (2nd edition, Vol. II, page 905) makes the following statement: "Dieselben besitzen nur sehr geringe Beständigkeit und meist eine sehr wechselnde Zusammensetzung."

Hager[3] gives a method for preparing this salt according to which equal parts of tannic acid and bismuth hydroxid are employed; the excess of acid being removed with diluted alcohol. This forms a much more basic salt than that described above.

E. Dieterich in his Manual (5th edition) gives a method according to which about equal molecules of bismuth hydroxid (BiO.OH) and tannic acid in water are evaporated to dryness. The resulting product assays about 40% of Bi_2O_3 but contains free tannic acid which can be removed by shaking it with water and filtering. A sample treated in this manner without carrying the washing very far yielded 56% Bi_2O_3.

A commercial sample was examined which yielded 52.4% of Bi_2O_3. It was a heavy powder possessing a dirty yellow color which was due to oxidation. Another sample of lighter color assayed 36.2% of Bi_2O_3.

In order to determine if a pure salt can be prepared by the action of tannic acid on bismuth subnitrate in the presence of water the following experiment was repeated a number of times:—30 parts of subnitrate (assaying 79.9% of Bi_2O_3) was mixed with 34 parts of tannic acid and 150 parts of water and heated for several hours on a water-bath. The resulting products after washing and drying assayed: I, 48.3%; II, 53.7%; III, 46.32% and IV, 54.2% of Bi_2O_3.

In the last experiment a considerable excess of gallic acid was employed and in each case the mother-liquid gave a strong reaction for tannic acid. These results indicate that this method is not suitable for preparing a pure subtannate.

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[1] Pharmaceutische Rundschau, March 1895.

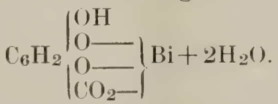
[2] Pharmaceutical Review, Vol. 14, p. 12.

[3] Manuale Pharmaceuticum, Editio Sexta.

The action of a solution of pure tannic acid on normal bismuth nitrate was next tried; the experiment was performed as follows:

233 parts of normal bismuth nitrate was rubbed to a powder in a porcelain mortar and a solution of 170 parts of tannic acid in 1000 parts of water was added under constant stirring with a pestle, then another 1000 parts of water was added and the mixture set aside for several hours. It was then washed by decantation until the washings were no longer acid, collected on a filter and dried first at the ordinary temperature and finally at about 60° C. for a short time. After sifting, a voluminous impalpable canary-yellow powder resulted which resembles the subgallate very much in appearance. It assayed 40.3, 41.7 and 41.8% of Bi_2O_3 (3 estimations) which conforms very closely to the theoretical requirement of a salt of the formula $C_{14}H_7O_9Bi_2H_2O$ or $C_{14}H_9O_9Bi(OH)_2$ both of which demand 41.5% of Bi_2O_3.

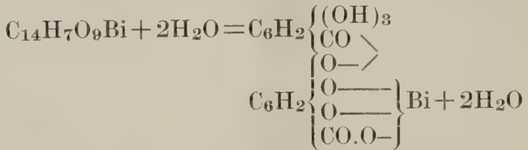
It would appear that Causse[4] has proven that the formula for bismuth subgallate is:



$$C_6H_2\left\{\begin{array}{l} OH \\ O\text{——} \\ O\text{——} \\ CO_2\text{—} \end{array}\right.\!\!\left.\begin{array}{l} \\ \\ \\ \end{array}\right\}Bi + 2H_2O.$$

He attributes the yellow color of this salt to the saturation of two phenol (OH) groups with 2 bismuth bonds as shown in the above formula. To substantiate this he has prepared a white salt from triacetylgallic acid of the formula $(C_2H_3O.O)_3C_6H_2CO.OBi(OH)_2$. He also found that the subgallate lost 9% or 2 molecules of water at 100° C.

As bismuth subtannate also possesses a yellow color we may expect that it has the composition:



$$C_{14}H_7O_9Bi + 2H_2O = C_6H_2\left\{\begin{array}{l} (OH)_3 \\ CO \diagdown \end{array}\right.$$
$$\phantom{C_{14}H_7O_9Bi + 2H_2O = {}} C_6H_2\left\{\begin{array}{l} O\text{—}\diagup \\ O\text{——} \\ O\text{——} \\ CO.O\text{—} \end{array}\right\}Bi + 2H_2O$$

The writer has, however, in no way conducted experiments which will substantiate this view.

Bismuth subtannate, prepared as above, is a voluminous impalpable canary-yellow powder resembling the subgallate in appearance. It may be distinguished from the latter by being but very slowly soluble in a 50% solution of sodium hydroxid at the ordinary temperature but readily soluble in a boiling solution. The subgallate dissolves almost instantly in a cold solution of sodium hydroxid.

Laboratory of Lehn & Fink, New York.

◆

The Pollen of Typha latifolia L.

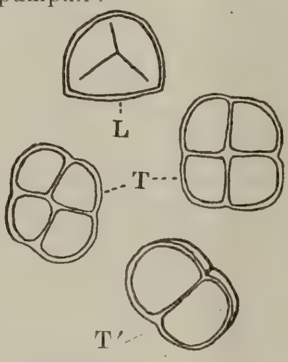
By Dr. *Rodney H. True.*

The great abundance in many localities and the readiness with which it can be gathered, suggests that the pollen of the common cat-tail, *Typha latifolia* L., might be of interest to the pharmacist.

Although noted by a number of European authors as a frequent adulterant of lycopodium powder, in company with the pollen of the pines and the hazel, no evidence has been found indicating that it has been put to this use in America. An examination of a number of samples from various sources has failed to reveal its presence.

In this connection it is of interest that in Japan the pollen of a related species, *Typha Japonica* Miq., is used as a drug called *Hoh-oh.* It is described as being inflammable like lycopodium. In China, the pollen from *Typha bungeana* is used as a desiccant, astringent, styptic and sedative and is also made into a confection for external and internal use. It has neither taste nor odor.[1]

In the mass, the pollen of our cat-tail has a bright yellow color much deeper than the pale, creamy yellow of the lycopodium. When rubbed between the fingers, much the same slippery feeling though less marked than in the latter, is noticed. It is also somewhat more readily wetted by water. The pollen is tasteless and has a faint odor resembling somewhat that of a freshly opened pumpkin.



L. Lycopodium spore.
T. Typha pollen grains seen endwise.
T′. Typha pollen grain seen from side.
Both magnified 400 times,

When examined microscopically, a quite distinctive structure is observed. The pollen grain is four-celled, the two dividing planes cutting each other at right angles and perpendicularly to the same plane, giving to the object when seen endwise with reference to the individual cells, a packet-like appearance. (See cut.) The surface unless highly magnified appears smooth. It is very slightly roughened with minute projections. The contents have a granular appearance. In size the pollen grain is approximately the same as the lycopodium spore.

The average size of the latter is 0.033 mm. varying between 0.030 mm. and 0.036 mm. The average size of the pollen grain is 0.035 mm. varying between 0.033 mm. and 0.039 mm. When the pollen is shaken from the cat-tail spikes, numerous small fibres are found. These slender, thin-walled structures are present abundantly in the male flowers with the stamens and easily fall off when the pollen is gathered. The material here described was gathered at Madison, Wis., in the summer of 1895.

◆

Das historisch-pharmaceutische Central-Museum zu Nürnberg.*

Von Dr. *Hermann Peters in Nürnberg.*

Als das pharmaceutische Central-Museum das erste Jahrzehent seines Bestehens im Jahre 1894 hinter sich hatte, drohte die Gefahr, dass die Weiterentwicklung und der Ausbau desselben an

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[4] Pharmaceut. Ztg., 1893, p. 568; from Compt. rend 193, p. 232, and Chemiker Zeitung, 1893, p. 594, and Pharmac. Rundschau, 1895, p. 65

[1] Pharm. Journ. Trans. Sept. 13, 1879, 202. Proc. Am. Pharm. Assoc. 28, (1880), 103.

Geldmangel scheitern könnte. Nach dem bei der Gründung gestellten Voranschlage war zur Beschaffung einer des deutschen Apothekerstandes würdigen pharmaceutischen Sammlung mindestens die Summa von 40,000 M. erforderlich. Kaum der dritte Theil dieses Betrages war bis dahin zu dem Zwecke zusammen gebracht und verausgabt worden. Mit diesen Mitteln ward zunächst eine historische Apotheke und einige Jahre später das alchemistisch-pharmaceutische Laboratorium eingerichtet.

Auch das Archiv und die Bibliothek erhielten reiche Zugänge an werthvollen alchemistisch-pharmaceutischen Handschriften und Druckwerken. Mit der Sammlung alter obsoleter Droguen und Arzneistoffe war ein guter Anfang gemacht worden. Alle diese Anfänge waren indess in ihren Theilen lückenhaft und der Vervollständigung bedürftig. Leider liefen aber die Beiträge und Spenden für das Unternehmen von den Freunden und Gönnern desselben in den letzten Jahren immer spärlicher ein. Das Jahrzehent, für welches der Apothekerverein dem pharmaceutischen Central-Museum einen jährlichen Zuschuss von 500 M. bewilligt hatte, war vorüber. Das an den deutschen Apothekerverein gerichtete Gesuch um Gewährung eines weiteren regelmässigen Jahresbeitrages kam nicht einmal an die Generalversammlung desselben und war völlig erfolglos. So waren die Aussichten für die Weiterentwicklung der pharmaceutischen Sammlung im Anfang vorigen Jahres trübe und unerfreulich.

Mit Freuden wurde es daher von den Leitern des German. Museums begrüsst, als aus pharmaceutischen Kreisen heraus vor Jahresfrist die Anregung gegeben wurde zur Bildung eines Comité's, dessen Aufgabe es sein sollte, die Ziele und Aufgaben des pharmaceutischen Museums zu fördern und zu unterstützen. Zahlreiche Vertreter des Apothekerstandes und der Chemie, unter diesen nicht wenige wissenschaftliche Kapazitäten, fanden sich darnach zusammen und erliessen einen Aufruf, der um Gewährung der Mittel zur Durchführung des für das pharmaceutische Museum seiner Zeit aufgestellten Programmes bat. Nicht nur aus Deutschland und Oesterreich, sondern auch von vielen Vertretern der deutschen Pharmacie und Chemie im Auslande wurden daraufhin theils Beiträge auf die Dauer von 10 Jahren, theils einmalige Spenden bewilligt.

Wenn die bis jetzt zusammengeflossenen Geldmittel auch noch keineswegs genügen, um das aufgestellte Programm völlig durchzuführen, so konnte mit denselben an der gestellten Aufgabe nun doch rüstig und kräftig weiter gearbeitet werden.

Schon seit längerer Zeit war für die Ergänzung des Museums das Augenwerk auf die Erwerbung verschiedener, als verkäuflich bekannter, historisch-pharmaceutischer Sammlungen gerichtet. Am werthvollsten von diesen erschienen für die Weiterentwicklung des Unternehmens die zahlreichen, aus der Vorzeit erhalten gebliebenen pharmaceutischen Denkmäler, welche die Stern-Apotheke in Nürnberg besass. Da der neue Besitzer dieser Apotheke für diese kulturgeschichtlich und für das pharmaceutische Central-Museum höchst werthvollen Gegenstände in entgegenkommender Weise gegen früher einen mässigeren und eher annehmbaren Preis stellte, so ging dieser reiche Schatz, den keine andere Apotheke mehr zu bieten vermochte, am Ende vorigen Jahres in den Besitz des Germanischen-Museums über. Dieser Ankauf war für die Entwicklung aller Theile des historisch-pharmaceutischen Museums von hoher Bedeutung. Die erworbenen Gegenstände stammen grösstentheils aus der Zeit vom sechzehnten bis achtzehnten Jahrhundert. Sie haben vor andern käuflichen pharmaceutischen Alterthümern den grossen Vorzug, dass sie sich niemals in den Händen von Zwischenhändlern befanden. Man hat daher nicht zu befürchten, dass an ihnen Fälschungen begangen sind, und weiss bestimmt, dass sie wirklich aus einer alten deutschen Apotheke herrühren. Schon der Apotheker Albrecht Pfister, welcher bei der Herausgabe des im Jahre 1546 in Druck erschienenen Dispensatoriums des damals bereits gestorbenen Valerius Cordus mitarbeitete, war Besitzer dieser in der Bindergasse zu Nürnberg gelegenen Apotheke.

Eine besonders grosse Bereicherung an höchst interessanten Gegenständen lieferte der abgeschlossene Kauf für das historische Laboratorium. Die Aufstellung in demselben mussten desswegen fast ganz neu geordnet werden. Die zahlreichen Koch- und Destilliergeräthe von Kupfer, Messing und Zinn, welche jetzt in demselben zu sehen sind, stammen fast alle aus dieser neuesten Erwerbung. Die oft wunderbar geformten alten Alembicke, Retorten, Kolben, Sublimir- und Circulirgefässe u. s. w. von dunkelgrünem Glas, welche ihrer Gestalt nach aus dem 17. und 18. Jahrhundert herrühren, sind so zahlreich, dass mit denselben die Wände in dichtgedrängten Reihen bedeckt sind. Die jüngeren meist farblosen Glasgefässe der alten Chemie haben in dem Laboratorium nun nicht mehr Raum und müssen an einer andern Stelle untergebracht werden. Nicht nur vom kulturhistorischen, sondern auch vom malerischen Standpunkte aus betrachtet, macht das Laboratorium jetzt einen höchst wirkungsvollen mystischen Eindruck, von dem die meisten Besucher des German-Museums sich immer gerne für längere Zeit fesseln lassen. Wenn die Sammlungsgegenstände des Laboratoriums auch sicher vermehrt werden müssen, so blinzelt doch das ausgestopfte Krokodil, welches oben unter dem Gewölbe zwischen den beiden Rauchlöchern im Laboratorium aufgehängt ist, entschieden mit Wohlgefallen auf die vielen alchymistischen und pharmaceutischen Denkmäler der Vorzeit herab.

In dem Programm, welches bei der Begründung des historisch-pharmaceutischen Museums entworfen wurde, ist auch die Aufstellung einer alten Materialkammer vorgesehen. In dieser sollten alle Stoffe, welche in deutschen Landen in der Vergangenheit als abergläubische oder wirksame Arzneimittel gedient haben, angesammelt werden, so dass dadurch eine historische Droguensammlung entstände. Wie vorhin schon gesagt, sind gute Anfänge zu letzteren bereits gemacht. Bislang fehlten indessen noch ganz die alten Einrichtungsgegenstände für die historische Materialkammer. Aus der Sternapotheke haben wir jetzt nicht nur eine ganze Einrichtung für letztere, sondern auch eine solche für eine Kräuterkammer erworben. Die für die Aufstellung beider erforderlichen Räume werden in nächster Zeit neben der Apotheke, und zwar die Kräuterkammer über der Materialkammer neu erbaut werden. Die Einrichtung der Kräuterkammer stammt vom Jahre 1728 und macht dadurch einen eigenartigen Eindruck, dass jede einzelne Schublade in den Regalen unter der alten bandförmigen Signatur eine in Oel gemalte Landschaft aus der Umgegend von Nürnberg darbietet. In der Materialkammer fällt ein höchst werthvoller, mit besonderer Eleganz im Barockstyl gefertigter alter Arzneischrank von 7 Meter Länge und 4

Meter Höhe in's Auge. Zwischen den mächtigen, gewundenen, reich vergoldeten Säulen desselben befinden sich Thüren, welche mit runden in Blei gefassten Scheiben verglast sind.

Auch die Offizin erhielt zur Ergänzung aus der Sternapotheke viele pharmaceutische Utensilien und insbesondere eine höchst werthvolle Reihe schön bemalter Majolikatöpfe, welche aus dem 16. Jahrhundert stammen und italienisches Fabrikat zu sein scheinen. Unter der Stuckdecke der Apotheke fällt eine mit goldener Barockumrahmung versehene Tafel auf, welche die für Pharmaceuten zu beherzigende Inschrift trägt:

"Stell jedes an den Ort,
Wohin sich's füglich schicket,
Und siehe fleissig zu,
Dass es nicht werd verrücket."

Auf der Rückseite der Tafel findet sich die lateinische Uebersetzung dieser Mahnung:

"Ordine cuncta loces
Atque ordene singula serves,
Omnibus et rebus
Proprius esto locus.

Auch diese Tafel erfüllte früher ihren Beruf in der Sternapotheke. An Kunstgegenständen fanden sich bei dem Kaufe zwei ungefähr einen Meter hohe geschnitzte und bunt bemalte Holzfiguren. Dieselben sollen die Erfinder des Mithridates und des Theriaks, also Mithridates Eupator und den Leibarzt des Nero, Andromachos, vorstellen. Zwei andere Holzfiguren in liegender Stellung; welche sichtlich aus dem Anfange des 16. Jahrhunderts stammen, stellen die allheilende Panacea, die eine der vier Töchter des Aesculap, und den Achilles vor. Jene war bei den Griechen die Verkörperung der allgemeinen Heilkunst, Achilles dagegen die Personifikation der Chirurgie. Bekanntlich erlernte der letztere die Heilkunst von dem Centauren Cheiron,

"Dem Arzt, der jede Pflanze nennt,
Die Wurzeln bis in's Tiefste kennt."

Als Achilles aus Versehen den Telephus, den König der Myser verwundet hatte, stillte er das Blut und heilte er die Wunde dadurch, dass er den Rost vom Speere mit dem Schwerte auf die Wunde schabte. Hiernach galt Achilles als Erfinder der Wundheilkunst. —

Es ist bei dem zur Verfügung stehenden Raume nicht möglich, auf alle Einzelheiten der neuesten Erwerbung einzugehen; diese kurze Skizze wird indessen auch so wohl schon ahnen lassen, dass durch diesen jüngsten Ankauf das pharmaceutische Central-Museum in seiner Weiterentwicklung sehr gefördert worden ist. Leider sind die Geldmittel durch diesen ausserordentlich wichtigen Ankauf und den nothwendigen Bau der Material- und Kräuterkammern nun wieder sehr erschöpft. Hoffentlich finden sich Freunde und Gönner der Sache, welche durch ihre Beihilfe eine weitere Förderung des Unternehmens ermöglichen. Mögen sie des Goethe'schen Wortes gedenken:

"Wer nicht von dreitausend Jahren
Sich weiss Rechenschaft zu geben,
Bleibt im Dunkeln, unerfahren,
Mag von Tag zu Tage leben."

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* Verehrliche Redaktion!

Anbei senden wir Ihnen als Manuscript einen Artikel über die Fortschritte, welche unsere pharmaceutische Abtheilung in der letzten Zeit gemacht hat, zu gefälliger Benützung für Ihr geschätztes Journal.

Wir bemerken dazu, dass derselbe zu gleicher Zeit den übrigen pharmaceutischen Fachblättern und Nürnberger Zeitungen zugeht. Hochachtungsvollst,

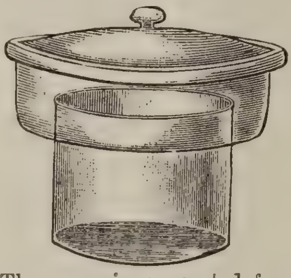
Germanisches Nationalmuseum:
Nürnberg, den 15. Febr. 1896. Hans Boesch, II. Direktor.

MONTHLY REVIEW.

Pharmaceutical Technique.

A New Desiccator.

Dr. Rob. Muencke of Berlin has introduced a new desiccator, which is constructed according to C. Reinhardt. The advantage claimed for this desiccator over others of similar form is that the entire body of the apparatus can be used for the reception of the substance to be dried. The desiccant occupies the trough surrounding the body of the apparatus. The cover is prevented from sliding off by the raised margin. Two sizes are constructed. The drying chamber of the smaller size is 8 x 8 cm., that of the larger size 15 x 15 cm.



Chemistry.

Estimation of Total Nitrogen in Urine.

Deniges recommends the Kjeldahl method, substituting, however, potassium oxalate for mercury. Potassium sulphate is formed, which increases the boiling point of the sulphuric acid, whereas the oxalic acid serves as a powerful reducing agent. If the foaming should become excessive upon the application of heat one to two ccm. of alcohol are added drop by drop. If the urine contains much sugar, from 5 to 10 ccm. can be added. In the rest of the process no changes are made.

[Pharm. Centrh. 37, p. 9; from Rèpert. de Pharm., 1895, p. 204.]

Distribution of Boric Acid in Nature.

Jay has examined a large number of different species of plants which had grown in a great variety of soils. As a result of his investigations he came to the conclusion that boric acid is found universally in the soil and that it is contained in all cultivated as well as wild growing plants. On the other hand animals do not absorb boric acid. If such is administered to them it is eliminated in the natural way and in a comparatively short time.

[Apoth. Ztg., 11, p. 97; from Compt. rend., 1895, No. 24.]

Reagent for Sulphuretted Hydrogen.

H. Krahl recommends the use of test paper moistened with a solution of nitro prusside of sodium to which a few drops of stronger ammonia water have been added. The test paper is placed into the mouth of the testtube or flask in which the sulphuretted hydrogen is generated. The presence of mere traces of this gas is indicated by a purple coloration of the test paper.

[Zeitsch.. d. allg. oest. Apoth. Ver., 50, p. 206.]

The Presence of Sodium in Aluminium Prepared Electrolytically.

In addition to nitrogen and carbon, which have already been shown to influence the properties and application of aluminium, Moissan has recently found sodium in aluminium prepared electrolytically. From 0.1 to 0.42 p. c. of sodium was found in different specimens. Water affects such aluminium, first slowly, but after it has become alkaline, more rapidly. The detrimental influence of the sodium is also perceptible in alloys.

[Ber. 29, Ref., p. 1; from Compt. rend., 121, p. 794.]

A Delicate Test for Albumen in Urine.

The following directions are given by A. Jolles. To 4–5 ccm. of filtered urine, acidulated with 1 ccm. of 30 p. c. acetic acid, 4 ccm. of the following reagent are added and the mixture shaken: mercuric chloride 10.0, sodium chloride 10.0, succinic acid 20.0, distilled water 500.00. To a second like quantity of urine, acidulated with a like amount of acetic acid 4 ccm. of water are added. By comparison traces of albumen in the dilution of 1:120,000 can be detected. The reagent is not applicable to urine containing iodine.

[Ber. 29, Ref., p. 144; from Z. physiol. Chem., 21, 306.]

Botany and Pharmacognosy.

Tabasheer.

Tabasheer or Tabûsheer, a white, smooth, porcelain-like deposit rarely present in the nodes of the bamboo, supposed by the natives in Trinidad and the East Indies to have valuable medicinal properties, has been found by W. H. Ince to be a rather variable composition of large quantities of silica with indefinite amounts of the oxide of iron, calcium and potassium.

[Pharm. Journ., Feb. 22, 1896, p. 141.]

Certain Citrus Fruits.

In an article on the fruits going under the name of shaddock, grape fruit and forbidden fruit, Charles H. La Wall reviews at some length the numerous and frequently contradictory references to this group of fruits and concludes that although sometimes used popularly as synonyms, they are in reality three distinct things. The forbidden fruit is a pear-shaped variety of the species *Citrus Paradisi* Macfayden, the shaddock and the grape fruit are to be regarded as different varieties of the same species, *Citrus decumana* L.

[Am. Journ. Pharm., 68, p. 121.]

Note on the Root of Rumex Nepalensis.

In a communication on rhubarb O. Hesse (Pharm. Journ., 4, 1, p. 325) had called attention to the fact that the root of *Rumex nepalensis* contains no chrysophanic acid as Hooper supposed, but substances that are in part similar to this acid. Inasmuch as A. G. Perkin (Chem. Centralbl., 1896, 1, p. 209) announced that he was going to make a study of this root O. Hesse makes the preliminary announcement that he has obtained and partly examined the following substances:

1.) $C_{15}H_{10}O_4$, isomeric with chrysophanic acid, constitutes golden yellow laminae melting at 186–188°;

2.) $C_{16}H_{12}O_4$, orange-red needles melting at 136°; and

3.) $C_{18}H_{16}O_4$, greenish-yellow prisms melting at 158°.

Of these, No. 1 dissolves in sodium carbonate solution with a yellowish-brown color; Nos. 2 and 3 are insoluble therein, but dissolve readily in caustic potash solution with purple color. No. 2 is supposed to be the monomethyl ether of the first, and No. 3 the trimethyl ether of No. 1. No positive proof, however, has thus far been brought in favor of this supposition.

[Ber. 29, p. 325.]

Preparation and Composition of Tofu.

In order to make up the deficiency of proteids in rice, the inland inhabitants of Japan utilize various leguminous seeds, especially the soja bean. Two products prepared from this bean, *miso* and *natto*, have already been described (Kellner, Tokyo Bull., 1, No. 6.) According to M. Inouye a third preparation of soja beans, tofu, is obtained by pulping the beans after soaking them for 12 hours in water, boiling with water (3 parts) for an hour and filtering through cloth; the liquid, which resembles milk in appearance, and fresh malt in taste, has a neutral or slightly acid reaction, but after several days becomes strongly acid (lactic acid), when the separation of casein takes place. In manufacturing tofu, the fresh filtrate is treated with about 2 percent of concentrated sea-water, the flocculent precipitate slowly pressed and cut into tablets; the product has the taste of milk casein. In the beans themselves, the casein is in a soluble form in combination with potassium or sodium, and is not coagulated by boiling, but is precipitated by the calcium and magnesium salts in the brine; when tofu is boiled with 1 per cent. aqueous disodium phosphate, the casein redissolves, yielding an opalescent solution, calcium phosphate being formed.

Tofu is sometimes subjected to the action of frost, when it contracts and loses a large amount of water; the product is called koridofu. The following numbers show the percentage composition of (1) the fresh milky liquid, (2) tofu (Kellner), (3) koridofu, and (4) yuba, (prepared by evaporating the soja bean extract):—

	Water.	Proteids.	N-free extract.	Fat and lecithin.	Cellulose.	Ash.
1.	92.53	3.02	1.88	2.13	0.03	0.41
2.	89.29	4.87	4.35	....	....	0.48
3.	15.32	41.42	15.05	23.65	1.48	3.08
4.	21.85	42.60	7.65	24.6	....	2.82

The milky extract left for two weeks contained 0.092 gram of lactic acid per 100 cc. The dry tofu yielded 11.2 per cent. of lecithin. According to Osawa, tofu is as readily digested as beef.

[J. C. S., 70^{II}, p. 65; from Bull. Coll. Agric., Imp. Univ. Tokyo, 2, p. 209.]

The Antiquity of Wheat.

In a recent work on prehistoric botany, by Georg Buschan, reviewed by Dr. Karl Müller, some interesting features are brought forward. The author, in agreement with earlier writers on the subject, regards wheat as the cereal oldest in cultivation. Thousands of years before our era it was distributed not only over the older civilized lands of Asia — Mesapotamia, Babylonia, China, India, and of Africa — Egypt — but also over a great part of Europe. The pictorial and written evidences from Egypt reach back into the third century B. C. and show us that wheat was then the staple bread-stuff and was, therefore, cultivated on a large scale. Also in Palestine, evidences of wheat cultivation are found pointing back to the most ancient times. The Pentateuch is held to assert that it was a land fruitful in grains. Many other citations from the Old Testament are taken to refer to wheat and wheat-raising. Evidences tend to show that wheat was cultivated in the neolithic period, a time at which man had already begun to cultivate the soil. Toward the close of this period, European wheat-fields were not confined to the coasts of the Mediterranean but stretched northward to the Alps. The beginning of the history of the classic peoples found wheat among them and the Homeric Greeks knew two kinds: the common wheat and the spelt.

The author gives considerable attention to the question of the identification of these ancient types and their bearing as evidence on the problems of race migration. [Die Natur., 44, 5. 531.]

Essential Oils of Black and White Peppermint.

Peppermint has been cultivated in the district of Mitcham, England for about 150 years. The two varieties of the plant, *Mentha piperita*, grown about Mitcham are known as black and white peppermint respectively, the black mint occupying the greater part of the acreage of cultivation. The preference given by growers to the black is based chiefly upon the fact that the plant is more hardy than the white variety, and the yield of essential oil is considerably greater.

Although dealers are of the opinion that the difference between the oils of the two varieties is more imaginary than real, and in spite of the fact that the cultivation of white peppermint has largely been discontinued, there continues a constant demand for certain purposes for oil of white peppermint, notwithstanding its value is considerably higher than that of the black mint oil.

Mr. John C. Umney has recently made a chemical examination of both varieties of oil and finds that the white oil has a greater optical activity (—33° against — 25.5° for the black), that it does not deposit menthol at a low temperature but contains a greater proportion of menthyl esters (13.6 p. c. against 3.7 p. c. for the black.) [Pharm. Journ., 1896, p. 123.]

Practical Pharmacy.

Preparations from Animal Organs.

Cerebrum exsiccatum pulv., made from the brain of calves, is employed by English and American physicians in *neurasthenia*. The *liquor cerebri sterilisatus*, prepared from the fresh brain (gray matter), is administered subcutaneously. Preparations known in England under the names cerebrin alpha or *cerebrinin* were tried by Ryan and Montagnon in *chorea*. and by Vetlesen in *neurasthenia* with good effects, while they were of little use in the cure of feeble-minded persons.

Glandulae suprarenales sicc. pulv., prepared from the suprarenal glands of cattle and sheep (one part of the dried gland corresponding to about five parts of the fresh organ), according to Oliver, Schäfer, Moore and Nobarro, causes a contraction of the arteries with corresponding increase of blood pressure, while also exerting a tonic influence on the heart. Since the preparation is not destroyed by pepsin in dilute acid solutions, it can be administered through the mouth. In *morbus Addisonii* the result was astonishing. A case of *diabetes insipidus* was much improved, and Oliver claims that a good effect is experienced in all cases depending upon a loss of vasomotor tone; e. g., *menopausis*, *neurasthenia*, *cyclic albuminaria*, *diabetes mellitus* and *insipidus*, *morbus Basedowii*, and diseases of the heart. Given in powder or tablet form, 0.2 g., 2—3 times daily, one hour after meals.

Hypophysis cerebri sicc. pulv. and tablets, from the pituitary gland of freshly killed cattle, were used by Marinesco in three cases of pronounced *acromegalia* (enlargement of the body extremities, colossal growth of the limbs from thickening of the bones). Though it was impossible to decrease the size of the extremities, the headache and neuralgic pains were diminished and an increased diuresis observed.

Medulla ossium rubra sicc. pulv. The red marrow of bones is now recognized by physiologists as the seat of formation of the red blood corpuscles, and that of cattle is employed to stimulate blood formation. Frazer, Barrs, Drummond and Billings have worked with positive success. Barr cured a difficult case of pernicious *anaemia*, that had been rendered worse by treatment with arsenic. Combe obtained improvement and sometimes cures in *chloranaemia*, *rachitis*, and *anaemia pseudoleucania infantum*. The dried marrow is given in tablet-form, in doses of 0.2 g.

Ovariinum siccatum pulv. and tablets are prepared from the ovaries of cows, and clinical experiments are now in progress.

Prostata sicc. pulv. and tablets, prepared from the prostate glands of steers. E. Reinert at the XIII congress for internal medicine at Munich, reported concerning experiments with this new remedy in *prostate hypertrophy;* he prescribed at first ¼, later ½ of a gland, chopped fine and eaten with bread, twice or three times a week. After several weeks treatment, a decided decrease in the size of the organ occured; at the same time, improvement in general health and decrease of strangury. Unfavorable secondary effects were not observed; the urine remains free from sugar and albumen. The permanent preparation put up by Merck in tablet-form contains 0.1 g. of the dried gland-substance; dose, 5 tablets daily, administered in two doses.

Renes siccati pulv. is prepared from the kidneys of sheep and hogs. Schiperowitsch prescribed fresh kidneys and the dried extract with 35 nephritic patients; diuresis increased in spite of a meat diet, and the albumen decreased or disappeared entirely from the urine. In cases of shrunken kidneys, *polyuria* diminished and the general health improved; uraemic symptoms disappeared also. Donovan secured similar results in *nephritis* accompanied by general *anasarca* (dropsy of the skin).

Thymus sicc. pulv. and tablets, prepared from the fresh thymus gland of calves and sheep. J. Miculicz has instituted investigations as to whether this gland could not be substituted for the thyroid gland in the treatment of goitre, and found his theory verified. A case of goitre and one of *morbus Basedowii* were very favorably influenced, the only difference being that in the treatment with thymus, neither heart-disturbances nor loss of weight occured. There was employed five to six times the quantity used with thyroid. In cases of increased uric acid formation, the use of thymus must be avoided, as it increases the quantity of this substance formed and eliminated. Daily dose: 12—15 tablets containing each 0.05 g. of the dried substance, corresponding to 0.3 g. of the fresh gland.

Thyreoidinum siccatum, according to experiments, is indicated in a large number of diseases. Worthy of mention are the curing effects in skin diseases; Stieglitz noticed the disappearance of nail deformities and of circumscribed *scleroderma*; J. W. White, of hypertropic scars; W. Scatchord treated *pityriasis rubra* with good results; A. Nobbs and others, *ichthyosis*; Byron, Brommel, and Abraham, *lupus*. Though used several times in *psoriasis* without any effect, in other cases favorable results were noted. Jonin found thyroidin very beneficial in *fibroma* of the uterus, Meltzer used it in sporadic *cretinism*; Gouladse in *syphilis*, and Morin in incipient *tuberculosis*. Besides being the best remedy against corpulency, it seems to have a beneficial action in *morbus Basedowii*.

Thyreoidinum depuratum is prepared by Merck after a process discovered by Dr. Notkin of Kiew. According to Notkin, two physiologically active albuminous substances are contained in the normal thyroid gland, thyroproteid and thyroidin. Thyroproteid, in dry condition, consists of transparent lamellae, and is a homogeneous substance which, when introduced into the animal organism, produces an acute poisoning in which depression symptoms are most prominent. The thyreoidinum depuratum consists of at least two albuminous bodies, of which one shows the properties of globuline while the other, the physiologically more important one, has the nature of an enzyme. It forms a pale yellow, adhesive, hygroscopic powder of much greater poisonous action than thyroproteid, stimulation being very pronounced. Thyroproteid is a product of tissue-changes; thyroidin, a specific product of the thyroid cells, which acts as an enzyme upon the former, changing it and rendering it harmless. When the function of the gland ceases (through extirpation), acute poisoning results from the accumulation of thyroproteid; if the gland dies through atrophy, the well-known picture of *myxodem* is the result. Thyroidin is not attacked by pepsin-hydrochloric acid, which fact explains its action, when given internally, of decomposing or neutralizing the thyroproteid. Thyroidinum depuratum is readily soluble in water and can be administered in liquid (subcutaneously), as well as in solid form. Notkin uses the following:

Internally,
℞. Thyreoidinum dep., 0.25 g.
Kaolini 3.0 g.
Vanillini 0.01 g.
Muc. Tragac. q. s. ut f. pil. No. XXV.
S. One to two pills daily.

Subcutaneously,
℞. Thyreoidinum dep., 0.05 g.
Aq. dest., 10.0 g.
S. One pravaz-syringe full daily.

To prevent decomposition, carbolic acid (0.02 g.) or 1 drop of chloroform should be added to the above.

The manufacture of the above preparations must be undertaken with the greatest care; only the organs of perfectly healthy animals, freshly killed, should be used. Especially in the case of thyroidin, Merck recommends keeping in rooms protected from heat, moisture, light, and air.

Food Stuffs.

The Value of Skimmed Milk as a Food.

It is claimed that in European countries bread constitutes about three-fourths of all solid foods. Bread alone, however, is not sufficient for satisfactory nutrition, fat and albumen being wanting. Inasmuch as albumen is the most expensive of all food stuffs, a reasonable increase in the amount of albumen in food, without a material increase in the price of the latter, is therefore of considerable economic importance. Such a means is to be had in the use of skimmed milk in the place of water in the manufacture of bread. If bread is so made that 100 parts of flour yield 120 p. bread 0.65 liter of skimmed milk should be used for every kilo of flour. One kilo of bread will therefore contain the valuable constituents of ½ liter of skimmed milk. Bread thus prepared will then contain 1.75 grams albumen and 24 grams milksugar more to the kilo than when prepared with water.

In order to ascertain whether this extra food in the bread is made use of by the digestive tract H. Rechsteiner and W. Spring for three days experimented upon themselves. The loss of dried substance varied from 2.95 to 3.84 p. c., the loss of fat from 1.41 to 3.3 p. c. that of albumen 5.93 to 11.18 p. c. It thus becomes apparent that very good use is made of the food value of skimmed milk.

[Pharm. Centrh., 37, p. 7; from Milchztg. 1895, p. 814.]

Physiology, Pharmacology and Therapy.

Animal Life without Bacteria in the Digestive Tract.

In order to disprove Pasteur's view that animal life without intestinal bacteria is impossible Nuttall and Thierfelder raised guinea pigs, which had been born by means of the Caesarean section, in a sterilized chamber with sterilized air and food. In an ingeniously constructed apparatus (see original) these animals were fed hourly with undiluted sterilized cows' milk. One such experiment was carried through a period of eight days. The animals were then killed and the microscopical examination of the intestinal contents revealed the absence of bacteria. Cultures from the large and small intestines also gave negative results.

[Ber. 29, Ref., p. 45; Z. physiol. Chem., 21, p. 109.]

Immunity of Lower Organisms against Leadpoisoning.

In a pile of decaying bark mixed with refuse of a whitelead factory numerous lower organisms, among them earth-worms, *Lumbrinus minor*, were found. They all contained lead. The decaying mass of bark contained 1.5 to 2.5 p. c. lead oxide. Examinations that have been carried on by T. W. Hogg since 1884 revealed the presence of 1.75 to 2.60 p. c. of lead oxide in the dry substance of the worms, equivalent to 0.35 to 0.52 p. c. of the living weight of the worms.

[Ber. 29, Ref., p. 49; from Chem. News, 71, p. 223.]

Gaseous Fermentation in the Human Stomach.

E. Wissel has analyzed according to Hoppe-Seyler's method the gases obtained from the stomachs of six persons suffering from various diseases. The gases of the stomach were always found mixed with atmospheric air. He found O, N, CO_2 and H, the latter two always in large quantities. The ratio of CO_2 and H was approximately 1:1; as a rule however there was more hydrogen. The largest amount of CO_2 and H was found about four hours after meals. By washing the stomach, especially with sodium bicarbonate solution, the amount of gases was diminished.

[Ber. 29, Ref., p. 49; from Z. physiol. Chem., 21, p. 234.]

Iodates in Medicine.

1. Silver iodate is used internally in doses of 0.005—0.01 gm. as an intestinal astringent, and is prescribed for acute diarrhœa and chronic catarrh of intestines. It does not interfere with the functions of the stomach. Administered in pills the same as the iodates of mercury, zinc and strontium.

2. Lithium iodate is administered subcutaneously (0.1%) in kidney colic; in cases of chronic gout 0.15—0.2 gm. internally.

3. Mercuric iodate is easily soluble in solutions of potassium iodide, the solution being clear and quite stable. (Dist. water 10.0 gms., mercuric iodate 0.115 gm., and potassium iodide 0.08 gm.; to be used subcutaneously.)

4. Quinine iodate is used in doses of 0.05—0.10 gm. as a nerve tonic and antineuralgic; it is soluble in water.

5. Strychnine iodate. Doses of 0.006 gm. should not be exceeded.

6. Codeine iodate is more active than any other salt of this alkaloid, and can be used as a substitute for morphine without producing constipation. Dose, 0.03—0.05 gm.

7. Hyoscine iodate is twice or three times as active as any other hyoscine salts. Prescribed in iritis and keratitis as a mydriatic. Maximum dose, 0.5 m. gm.; subcutaneously 0.1—0.15 m. gm. Action is prompt in 0.05—0.07% solutions.

8. Atropine iodate. Its solution remains germ-free for a long time, and does not require sterilization nor the addition of antiseptics. These latter two remedies act more rapidly than any other mydriatics but their effects are less lasting.

[Therap. C. Bl.; Ph. Post, 1895, p. 537.]

Action of Carbonic Oxide on Man.

The experiments made by the author, John S. Haldam on himself show that the symptoms caused by carbonic oxide depend on the extent to which the hæmoglobin has been saturated; the percentage saturation of the hæmaglobin of the red corpuscles may be estimated during life by a simple colorimetric method. Carbonic oxide is a "cumulative" poison. The symptoms do not become sensible during rest until the corpuscles are about one-third saturated; with half saturation, the symptoms (respiratory distress, headache, etc.) become urgent. Similar experiences are experienced by mountaineers at high altitudes.

When air containing this gas is breathed, about half of that actually inhaled is absorbed, except when absorption is coming to a standstill. The time required for the production of sensible symptoms in an adult depends on the time required for the inhalation of about 660 cc., or the absorption of about 330 cc. of the pure gas; this time in different animals varies with the respiratory exchange per unit of body weight, and is about 20 times as long in a man as in a mouse; hence a mouse can be used as an indicator in a coal mine before men penetrate into it.

The maximum amount of carbonic oxide capable of being absorbed by the blood from air containing a given small percentage depends on the relative affinities of oxygen and carbonic oxide for hæmoglobin, and the relative tension of the two gases in arterial blood. The affinity of carbonic oxide for hæmoglobin is about 140 times that of oxygen, and the oxygen tension of human arterial blood is approximately, 16 per cent. of an atmosphere. Distinct symptoms, appreciable during rest, are not produced until about 0.05 per cent. of the gas is present; with about 0.2 per cent. urgent symptoms are produced. With a given percentage of carbonic oxide in air, a certain percentage saturation of the blood is reached within about 150 minutes, and is not afterwards exceeded, however long the breathing of the vitiated air is continued. The disappearance of the gas from the blood when fresh air is again breathed is always much slower than the absorption of the gas, and is chiefly due to dissociation of carbonylhæmoglobin by the mass influence of the oxygen in the pulmonary capillaries, and consequent diffusion of the gas outwards through the alveolar epithelium.

[J. C. S., 70^{II}, p. 52; from J. Physiol., 18, p. 430.]

Ferratin: Iron Tonic and Food.

Many of the numerous preparations of iron when administered are not readily absorbed, or are rendered worthless by the changes which they undergo through the action of the hydrochloric acid in the stomach and the sulphuretted hydrogen in the intestinal tract. According to Bunge these inorganic iron preparations are solely of use in combatting and neutralizing the hydrogen sulphide present in the alimentary canal; the hæmoglobin present in the red blood corpuscles deriving its iron constituents from the organically combined iron in food.

Prof. Schmiedeberg, in 1893, after extended experimentation, contributed an article on the dietetic and therapeutic uses of an artificially prepared iron compound which he termed Ferratin. It is a rusty colored fine powder not unlike oxide of iron. This iron compound he extracted from the pig's liver and it is looked upon by him as the natural form in which iron is taken with the food. It is claimed that it is easily absorbed, does not cause constipation, headache or gastic irritation even after prolonged use, as is confirmed by Germain Sée and others, greatly in contrast with the ordinarily used inorganic iron compounds. The therapeutic importance of ferratin is based upon the fact that after its absorption it is stored up in the liver and is immediately available for use, while all other compounds and simple albuminoids, after their slow and difficult absorption, are stated to undergo a change into ferratin before they are active agents for supplying the organism with the amount of natural iron which it requires to maintain all vital functions of nutrition and growth.

In the past two years numerous experiments with ferratin have been made. Dr. J. S. Perckhan has recently reported on his experience with ferratin and comes to the conclusion that "ferratin" can be safely recommended as a hæmatinic remedy, but suitable diet, hygiene and exercise are not to be neglected.

On the Normal Occurence of Iodine in the Animal Body.

E. Baumann has prepared from the thyroid gland a compound called thyroiodin, which contains iodin in organic combination. Roos has demonstrated the efficacy of this preparation when administered to man or dogs. If the preparation contained but little iodin, the effect was accordingly slight; if iodin was absent, no effect whatever was produced. The ash after being treated with soda and saltpeter showed as much as 9.30 p. c. iodin. The thyroidal gland of man also contains iodin. Small quantities of this element were also found in colloidal scrofula. The thyroid gland of pig contains but little iodin. The presence of iodin is determined in the following manner: 26–30 g. of thyroid gland from sheep, from which most of the fat has been carefully removed, are boiled with 100 ccm. of 10 p. c. sulphuric acid for from 4–8 hours in a flask connected with a reflux condenser until almost all has gone into solution. The solution is cooled with ice water and filtered. Any fat that floats on the surface is removed. The brown-colored precipitate is washed with water, suspended with the filter in 250 ccm. alcohol of 85 p. c. and extracted two or three times with boiling alcohol. The alcoholic extracts are evaporated to dryness. The residue is brought into a silver crucible, a small amount of soda and a few drops of water are added and the mixture heated to a low redness. The fused mass is dissolved in water, after cooling acidulated with concentrated nitric acid and shaken with 3–6 ccm. of chloroform.

[Ber. 29, R., p. 144; from Z. physiol. Chem., 21, 319.]

Scientific Societies.

The Hundreth Anniversary of the first Vaccination by Jenner.

In honor of the hundreth anniversary of the first vaccination against small pox by means of cow's lymph by Jenner, the Russian Hygienic Society will publish a Russian edition of his treatise on vaccination, inaugurate an exposition of vaccination and establish a prize of 1000 rubles and a gold medal for the best treatise on vaccination. This treatise can be written in the Russian, German, French or English language.

Inasmuch as some confusion seems to exist in some pharmaceutical journals about the character of the anniversary it may not be amiss to state that Edward Jenner was born May 17th, 1749 in Berkeley. In 1796 he vaccinated with cow's lymph as a protection against small pox. In 1798 he wrote: Inquiry into the causes and effects of variolæ vaccinæ. He died in Berkeley Jan. 26, 1823.

Universities and Colleges.

Prof. J. H. van t'Hoff.

The well known Dutch chemist, Prof. J. H. van t'Hoff in Amsterdam, who a year ago was elected foreign member of the Prussian Academy of Science, has now received an invitation from the academy to come to Berlin. He is to fill the place of the late Prof. A. W. von Hofmann as chemist of the academy, but not as professor of chemistry at the University of Berlin, which position is now held by Prof. E. Fischer. A laboratory is to be erected for Prof. van t'Hoff, in which he can give all of his time to research. As member of the academy he also has the priviledge of giving a course of lectures at the university. Prof. van t'Hoff is only forty-four years old and has for a long time been counted among scholars of international fame. His name is generally associated by chemical students with the theory of the assymmetric carbon atom. No less important, however, is his theory of osmotic pressure, which has greatly assisted in establishing the modern theory of solution.

Secondary Pharmaceutical Education in England.

The Burroughs' Memorial Scholarship constitutes a not unimportant addition to the facilities afforded to British pharmaceutical students, who wish to extend their scientific training beyond what is strictly necessary for the due performance of their professional duties as pharmacists. For many years the Jacob Bell Memorial Scholarships were the only pharmaceutical scholarships that existed in this country, and the funds available in connection therewith have always been devoted exclusively to primary technical education. The Redwood Scholarship was founded on similar lines, but has since been diverted to the purposes of secondary education, and the Manchester Pharmaceutical Association Scholarship funds have been similarly employed, for, although intended for elementary students, no candidate has yet been successful in gaining the Scholarship. The Burroughs' Memorial Scholarship is likewise intended to encourage the extension of secondary education, and will, on account of its pecuniary value, be the most important in that connection. It is gratifying to observe that so many friends of pharmacy, while anxious to perpetuate the memory of deceased masters and friends, should find the best outlet for their sympathy with the work of the past in making fitting provision for elevating the position of the craft in the future.

[Pharm. Journ., 1896, p. 132.]

The First Lady Pharmacists in Hungary and Italy.

Mrs. Serena Varságh, the wife of an apothecary in Budakerz, who possesses the necessary secondary education has applied for admission to the University of Budapest. The assistants' examination, however, must be passed before a candidate can be admitted to the university, and there appears to be no published record of such event.

According to the Bolletino chimico-pharmaceut., Dorina Crespi Andina, the wife of the apothecary Leopoldo Crespi in Trecate, has passed the assistant's examination *cum honore* at the University of Genoa. The event has attracted considerable attention not only in Italy but also in other European countries. Americans have every reason to be somewhat amused at the seriousness with which many European pharmacists view such innovations of their realm by the other sex.

University of Pennsylvania.

A committee on medical and allied schools of the board of trustees of the University of Pennsylvania has under consideration a proposition providing for the gradual elevation of the requirements for entrance upon the course of study in the medical department, until in 1899 they shall be equal to those of the collegiate department. At a later date it is possible that a collegiate degree will also be made a requisite.

Central Tennessee College.

The graduating exercises of the Meharry Medical, Dental and Pharmaceutical Departments held commencement Feb. 4, at Nashville. The class consisted of twenty colored graduates: eleven from the Medical, three from the Dental and six from the Pharmaceutical Department. Of the last number one was a woman. It was the seventh anniversary of the Pharmaceutical Department, the others being older. The college is said to do excellent work for the colored people in all its departments. It certainly speaks well for a college that in the face of only six graduates in the Pharmacy Departments, has the courage to raise the requirements to those of a three years course, even if the year is not equivalent to the collegiate year generally.

Literary.

Books and Pamphlets Received.

Wilhelm Engelmann—Leipzig. Die Vegetation der Erde. Sammlung Pflanzen geographischer Monographien. Herausgegeben von A. Engler und O. Drude. Bd. 1: Grundzüge der Pflanzenverbreitung auf der iberischen Halbinsel. Von Prof. Dr. Moritz Willkomm. 1 gr. Octav Bd. Mit 2 Karten, 2 Heliogravüren und 21 Textabbildungen. 1886. M. 12.00.

Deutsche Verlags-Anstalt—Stuttgart. Lexikon der gesammten Technik und ihrer Hilfswissenschaften. Herausgegeben von Otto Lueger im Verein mit Fachgenossen. Mit zahlreichen Abbildungen. XI. Abtheilung. Bd. III., pp. 1—160. Calciumoxyd bis Dampfkessel. 1895. M. 5.00.

Wilhelm Braumüller—Wien. Handwörterbuch der Pharmacie. Herausgegeben von A. Brestowski. 24. (Schluss-) Lieferung, pp. 865—942. Zucker-zymotische Krankheiten. Nachtrag und Sach-Register. 1885. M. 2.40.

Merck & Co.—New York. Merck's 1896 Index. An Encyclopedia for the Physician and the Pharmacist. One vol. pp. 8, 268. 1896. $3.00.

Author.—Die oblita-schizogenen Secretbehälter der Myrtaceen. Inaugural-Dissertation zur Erlangung der philosophischen Doctorwürde vorgelegt der hohen philosophischen Facultät der Universität Bern. Von Gotthilf Lutz, Apotheker aus Winterthur. Mit 2 Tafeln, Brochüre. pp. 39. 1895.

Author—Oakland, Cal. Handbook of West-American Cone-Bearers. By J. G. Lemmon, Botanist California State Board Forestry. 1895. $1.00.

Author.—Untersuchung über die Sekrete, mitgetheilt von A. Tschirch. 16 Beiträge zur mikroskopischen Kenntniss des Opiums. Von Dr. Mjöen. Brochüre. pp. 35.

Lehn & Fink—New York. Diphteria Antitoxin and other Biological Products. From the biological and vaccinal department of the New York Pasteur Institute. Pamphlet. pp. 34. With several half-tone illustrations. 1896.

Author. — Anti-diphteritic Serum and Loeffler's Solution. With a report of twenty-six cases. By B. R. Shurly, B. S., M. D., House Physician to Harper Hospital, Detroit, Mich. Pamphlet. pp. 15. 1896.

Chemische Fabrik "Rhenania" — Aachen. The Properties and Uses of Nosophene, Antinosine and Endoxine, three new iodine compounds for external antisepsis. Pamphlet. pp. 8. 1890.

Author. — Was ist eigentlich Pharmacognosie? Prolegomena zur modernen Drogenkunde. Von Dr. A. Tschirch. Brochüre. pp. 12. 1896.

Reviews.

Lexikon der gesammten Technik und ihrer Hilfswissenschaften. Herausgegeben von Prof. Dr. Otto Lueger im Verein, mit Fachgenossen. Mit zahlreichen Abbildungen. Zweiter Band. Ballistisches Problem bis Calcium karbonat. Deutsche Verlags-Anstalt, Stuttgart, 1895. M. 25.00.

With the completion of the second volume of this work the reader is in better position to judge the scope and value of the same. Although designed especially for technical students it is of such a general character as to be of great interest to every intelligent reader. Even the pharmacist will find many articles of special interest to him, particularly those on chemical and sanitary subjects. The manufacturing pharmacist will find many illustrated articles on technical subjects that will appeal to him. The work is richly illustrated and the editor is assisted by not less than 120 colaborers.

The pharmacist like the general reader cannot well afford a library of exhaustive treatises on a large variety of subjects. Yet he cannot afford to remain totally ignorant in departments not strictly his own. A good technical encyclopoedia will no doubt prove of great value to the progressive pharmacist as well as to the general reader. Inasmuch as the work before us contains many illustrated articles on chemical technology, sanitation and hygiene it will be found especially serviceable to the pharmacist who naturally desires information on these subjects.

Aside from a large number of smaller articles on chemical subjects, those on baryum, lead (*Blei*), boron and bromine and their numerous derivations deserve special mention. Longer articles in the field of chemical technology are those on the Bessemer process, beer-brewing (*Bierbrauerei*), burners (*Brenner*) and fuels (*Brennstoffe*). Physical and physico-technical articles of special interest are those on the barometer and its application, electrical illumination (*Beleuchtung, elektrische*) and arc lights (*Bogenlampen*). Other articles on technical subjects that are well illustrated are those on the manufacture of tin and tin-implements (*Blechbearbeitung*) and of barrels (*Boettcherei*), the block system, arches and arched bridges (*Bogen und Bogenbrücken*) and book binding. Articles of an architectural character are those on library (*Bibliothek*), castle (*Burg*) and Byzantine architecture.

Articles on sanitation and hygiene and allied subjects are well represented in this volumn: *Bedürfnissanstalten, Berieselung mit städtischem Kanalwasser, Bewässerungssystem* and *Brunnen* will prove of particular value to persons interested in public sanitation. Other articles of like interest are those on soils (*Bodenarten*), the chemistry and physics of soils (*Bodenchemie* and *Bodenphysik*), the manufacture of bread (*Brotfabrikation*) and on wells (*Brunnen*).

The wide scope and general interest of the work thus becomes apparent. Even the sportsman will find the articles on *Besegelung, Boots bau* and *Bojen* contained in this volumn of special interest. This work gives prominence to such subjects as are usually considered in a secondary manner in general cyclopoedias and therefore admirably supplements these.

The paper is claimed to be free from wood fibre, the type is clear and the illustrations are on the whole very good. In using this work for ready reference some difficulty will be encountered in knowing just where to look for the desired information. It is to be hoped that the publishers will make this otherwise excellent work more valuable, especially for ready reference by furnishing a complete index to the work when finished.

E. K.

Einleitung in das Studium der Chemie. Von Dr. Ira Remsen, Professor der Chemie an der Johns Hopkins Universität in Baltimore. Autorisirte deutsche Ausgabe. Bearbeitet von Dr. Karl Seubert, a. o. Professor der Chemie an der Universität Tübingen. Zweite Auflage. Verlag der H. Laupp'schen Buchhandlung. Ein Bd., pp. XVI, 474. 1895. M. 6.00.

Prof. Remsen's text-books are widely and favorably known in this country and need no introduction to American students of chemistry. The fact however, that they should be translated into German and that a German translation should find its way back to America may create some surprise. German scientists are so well known as bookwriters that the translation of an American elementary text-book into German may justly call for an explanation for the sake of those who are not familiar with the situation. The fact that the book is an elementary one furnishes the explanation. The German language abounds in admirable text- and reference books of an advanced character. Neither is there a dearth of elementary text books, but these are ofttimes only guides or even mere skeletons. The competent teacher in Germany is expected to be a living text book. He places into the hands of the popular student a rudimentary guide or skeleton and in his lectures furnishes the mental thread, the soul as well as the flesh and blood. With the absence of a sufficient number of competent teachers in the natural sciences the situation in this country is quite different.

There exist also in the German language a number of more complete elementary text-books, but as a rule they differ from Prof. Remsen's book. The former ofttimes furnish a larger array of chemical facts, whereas the latter makes these facts simply the vehicle by which right chemical thinking may be inspired. The inductive method is emyloyed and the student is expected to perform most of the experiments himself, so as to become a careful observer. The detailed descriptions and explanations make the book valuable for self-instruction, but are not intended by any means to replace the instructor.

The need of such a book is evidently felt in Germany as well as here, through probably not as keenly. The fact that a second German edition, based upon the third American edition, has made its appearance seems to be sufficient evidence. The German edition is very largely a translation of the American, but additions have been made to several chapters with the consent of the American author.

The German translation is more than a mere curiosity on this side of the Atlantic. There are a number of Germans pharmacists as well as teachers of German secondary schools and colleges to whom this translation will be of interest.

Little or nothing need be said about the details of the book, since the American edition is so well known. It may suffice to state that illustrations, paper and penwork are good and a credit to the publisher, as the book in general is to its American author and German editor.

E. K.

Die natürlichen Pflanzenfamilien, nebst ihren Gattungen und wichtigeren Arten, insbesondere den Nutzpflanzen. Unter Mitwirkung zahlreicher hervorragender Fachgelehrten, begründet von A. Engler und K. Prautl, fortgesetzt von A. Engler, Professor der Botanik an der Universität und Director des botanischen Gartens in Berlin. Lief. 126—129. Verlag von Wilhelm Engelmann in Leipzig. 1896.

The successive issues of this foremost standard work on the flora of our globe have been duly reviewed in the pages of the Rundschau during the years of their appearance. This literary production, which is the joint work of specialists and leading botanists of Germany, will remain an unrivaled standard for many years to come. When completed it will comprise five large octavo volumes, each of about a thousand or more pages. with many thousand wood cuts. In progress of publication for about six years, its paramount value has been so fully recognized in the columns of this journal as well as everywhere else that no further comment in this regard is needed.

The latest issues of the "Pflanzenfamilien" contain further parts of volume 3 (*Sabiaceæ, Melianthaceæ, Balsaminaceæ, Rhamnaceæ*) and Volume 4 (*Acanthaceæ, Myoporaceæ, Phrymaceæ, Plantaginaceæ, Verbmaceæ, Labiatæ*). The 129th issue contains the first installment of the Cryptogames, edited by Prof. A. Engler, commencing with the now so important domain of the Schizophyta. Of these the group of Schizomycetes

(Bacteria) is first treated by Prof. W. Migula in Karlsruhe. After briefly reviewing the various preliminary methods of systematic discrimination the author has chosen the division of the *Schizomycetes* into the following five families: *Coccaceæ, Bacteriaceæ, Spirillaceæ, Chlamydobacteriaceæ, Beggiatoaceæ*. The *Schizophyta* thus far known are fully described and illustrated.

The 129 fascicles thus far published can be best obtained from the publishers, Wilhelm Engelmann, Königstr. 10, Leipzig, Germany, at a reduced subscription price. On application by postal card they furnish gratis and by mail a sample issue of 20 ppg., containing a full descriptive prospectus of the work. *Fr. H.*

Merck's 1896 Index. An encyclopedia for the physician and the pharmacist; stating the names and synonyms; source or origin; chemical nature and formulas; physical form, appearance and properties; melting and boiling points; solubilities; gravities and percentage strengths; physiological effects; therapeutic uses; modes of administration and application; regular and maximum dosage; incompatibles; antidotes; special cautions; hints on keeping and handling; methods of testing; market values, etc. of the chemicals and drugs used in medicine, in chemistry, and in the arts. Second edition. Merck & Co., New York. 1896. $3.00.

It is a rather remarkable phenomenon of the second half of this century, that whereas pharmaceutical manufactures have on the one hand materially assisted in commercalizing pharmacy, on the other hand they have ofttimes been strong supporters of the pharmaceutical sciences. The manufacture of fluid extracts, elixirs, pills and tablet triturates of almost all conceivable formulas and for almost all conceivable ailments has had a decided tendency to make a mere drug vender of the druggist. Many of these preparations, it must be admitted, have been manufactured better on a large scale than they could have been made by the average druggist, who has neither the facilities nor ofttimes the requisite knowledge and inclination to keep up the professional side of his calling.

The manufacturer was not long in learning the value of scientific aid and to-day there is hardly a large manufacturing establishment without one or more thoroughly educated chemists and with a well equipped laboratory not only for analytical work but also for research. As a result manufacturers have issued and still issue annual or semi-annual reports, some of which are of great scientific value. The impress of science was also made upon other publications. Journals were published "in the interest" of various professions, young M. D.'s were engaged to more scientifically expound the virtues of new discoveries. Even catalogues were given the stamp of scientific and historic research. There are treatises on pharmacy, which in some respects are less satisfactory than an excellent catalogue of a manufacturer of chemical and physical apparatus.

Merck's Index is in reality a descriptive catalogue of the firm Merck & Co., New York. The amount of information is so considerable that in some respects it might be termed a condensed pharmaco-medical encyclopedia. The title page gives a sufficient table of its scientific contents. A detailed criticism of the text is hardly a matter for one man. The chemistry, botany and pharmacognosy, therapeutics etc. each demand a specialist for detailed criticism that it is to be of value. It is not the writer's intention to make even a detailed criticism of all matters chemical. However, it may not be out of place to make a few remarks with regard to the chemistry of the volatile oils catalogued in the Index.

It is rather difficult to learn from the text what principle has been followed in selecting the information given. Under the titles of some volatile oils the chemical constituents are enumerated, under others not. Sometimes at least the "chief" constituent is mentioned, sometimes not; e. g. In one instance pinene is mentioned as the chief constituent, in others the same hydrocarbon evidently receives no recognition whatever. Again the chief constituent of eucalytus oil is given, viz. eucalyptol or cineol. Under cajaput oil, which contains the same substance, no mention whatever of chemical constituents is to be found.

With regard to sp. gr. the same general criticism might be made. The sp. gr. of officinal oils and of some others is given, but not of all. The sp. gr. of officinal oils can easily be found in the Pharmacopœia. If the Index is to supply such information "that *cannot be obtained* from any other book or books" it should furnish just this kind of information. If it is important to know the sp. gr. of officinal oils it cannot be unimportant to know the sp. gr. of other volatile oils catalogued in the Index.

The authors of Merck's Index do not claim perfection, but have asked for criticism in order that new editions of the work may be more and more perfected. If the book is to be used for ready reference, and for such its general makeup renders it adapted, it is highly desirable that all information should be accurate and in no way misleading. It is to be hoped, however, that Merck's Index will not entirely replace the "many volumes" from which its contents have been compiled. Books that, e. g., have the tendency to replace the Pharmacopœia do great harm. So also a single compilation of necessarily brief statements that strives to replace valuable works of reference may likewise do great harm. Chemical, pharmaceutical and other calendars contain much information convenient for ready reference, but they are not designed to replace the larger works from which their information is compiled. This is even true to a considerable extent of more encyclopædia works. A similar position should be accorded to Merck's Index and it will no doubt prove a serviceable volume.

A feature of the Index that is to be regretted is the alternation of advertisement with text. The opposition of the two does not tend to create a greater confidence in either. Certainly the authority of the text is weakened if, as it occasionally happens, it is opposed by the advertisement of preparations of questionable scientific merit. The more scientific methods are introduced into manufacture and commerce, the more will the latter prosper, but science does not benefit by commercialization.

The general make-up of the text leaves a favorable impression. The type is distinct and a sufficient variety has been employed to make ready reference easy. For a volume, which is to be replaced every year, the cloth binding is sufficiently durable. *E. K.*

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EDITORIAL.

The Metric System.

The bill before Congress* with regard to the metric system of weights and measures seems to have revived the general interest taken in the adoption of a system, that, with the exception of the English-speaking people, has found almost universal application among the civilized nations of the globe. The aggregate population of the countries in which the metric system has been established by law amounts to nearly 350 millions, of those in which it has been partially introduced, to about 70 millions, and of those where its use is permissible, to 70 millions more. It has thus been adopted by much more than half of the civilized and Christian world.

The metric system has been taught in many of our public schools for some time, yet a congressman stated recently in debate that as far as he could see there was no provision made for "wet measure" and inquired "Where is your measure for whiskey?" He continued: "I venture to say that Kentucky will have something to say about the adoption of this new-fangled system. Her delegation will be solidly opposed to it." That such a joke should be greeted with laughter surprises no one. Congress has recently supported jokes of greater gravity than this one.

Such remarks, however, which are born out of sheer ignorance, may teach us a lesson. They demonstrate very forcibly how much ignorance and ill-will based on ignorance and on the lethargy to accommode oneself to something new must be overcome before we can reasonably expect to meet with ultimate success in the universal introduction of a rational system of weights and measures.

Many of the advocates of the metric system seem to expect everything from legislation. A United States senator writes that in his opinion Congress has done about all it can do and that what remains to be done is its introduction into actual practice by those who advocate it.

Whereas pharmacists have on the whole taken a progressive position with reference to the adoption of this one system in place of a confusion of old systems, writers of influential textbooks and commentaries have at times held a dual position that was positively detrimental. The effect to be derived from the adoption of the metric system of weights and measures by the U. S. Pharmacopœia was well nigh counterbalanced by the practice of those writers who placed, directly opposite the quantities of the Pharmacopœia expressed in terms of the metric system, those of older systems. Inasmuch as some of these works contain the text of the U. S. Pharmacopœia almost verbatim they have greatly hampered the progress to be reasonably expected from the introduction of the metric system of weights and measures by the Pharmacopœia. It is to be hoped that if the British Pharmacopœia makes use of this system that writers of British textbooks and commentaries will not be so ready to compromise.

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* House bill No. 7251 provides in substance as follows:

"That from and after the first day of July, eighteen hundred and ninety-eight, all the Departments of the Government of the United States, in transaction of all business requiring the use of weight and measurement, except in completing the survey of the public lands, shall employ and use only the weights and measures of the metric system.

"That from and after the first day of January, nineteen hundred and one, the metric system of weights and measures shall be the only legal system of weights and measures recognized in the United States,"

We need, therefore, not blame Congress alone if the confusion of the older systems outlasts the present century. On the other hand we may hope that Congress, at present or in a near future, will do all it can to put a timely end to the present state of affairs. Inasmuch as the continuation of the old systems is based so largely on lack of information and familiarity with the new, anything that may possibly create an interest in that system which the English-speaking nations will be ultimately bound to adopt may be considered proper, particularly at this time.

It is frequently stated that the idea of taking unchangeable units from nature has been conceived in modern times and many labor under the supposition that the metric system is the universal system based on such a natural unit. As a matter of fact, however, the Chinese had such a system long before Europe was civilized, and as another matter of fact the meter, the liter, and the gram are arbitrary standards.

In 1673 Huyghens proposed the length of the second-pendulum as the unit of length, or rather one-third of the same as the *pes horarum* or time-foot (*Zeitfuss*). Huyghens supposed that the second-pendulum was equally long at all points of the globe. It, however, became known soon that the length of the second-pendulum was dependent on the latitude. Bouguer in 1749, therefore, suggested the length of the second-pendulum at the latitude of 45°; La Condamine the length of the second-pendulum at the equator as the unit of length. Neither of these propositions based on the unchangeable mass of the earth was carried.

The great variety of measures and their arbitrary and even deceitful application in taxation and commercial exchanges had given rise to numerous complaints throughout France. Among the demands of the three classes in 1789 "the abolishment of the diversity of measures" was made. On the motion of Prince Talleyrand, then Bishop of Antun, the demand received definite form in a decree of the National Assembly dated May 8th, 1790. The decree recommended the length of the pendulum beating seconds in latitude 45° as a suitable linear basis, and provided for a scientific determination of the exact lenght of this pendulum by a commission to be composed in equal numbers of members of the French Academy of Sciences and the Royal Society of London. Louis XVI, King of France, opened a correspondence on the subject with the King of Great Britain, but, owing to the temper and the public troubles of the times, this overture met with no response. Similar applications to other nations were more successful, and in subsequent proceedings, Spain, Italy, the Netherlands, Switzerland, Denmark and Sweden participated by sending delegates to an international commission. The system itself was, however, matured by the labors of a committee of the Academy of Sciences, embracing Borda, Lagrange, Laplace, Monge and Condorcet, five of the ablest mathematicians of Europe. Their report, dated Mar. 19, 1791, after considering the comparative fitness, as a standard of length, of the pendulum and of the earth itself in some one of its natural dimensions, decided in favor of the latter, and recommended as a standard unit of linear measure one-millionth of the quadrant of a terrestrial meridian. The report was communicated to the Assembly and received its sanction. Committees of the Academy were then charged with the duty of making the necessary determinations of the standard units, including those of capacity and weight as well as that of length. An arc of the meridian passing through Paris and extending from Dunkirk to Barcelona was measured trigonometrically by Delambre and Méchain, an operation of immense labor which occupied seven years; the object being to ascertain with the greatest exactness the length of the linear base called the meter. It was resolved to make the unit of volume equal to the capacity of a cubical vessel measuring one-tenth of a meter on its edges; and the standard of weight, the actual weight of distilled water which should fill such a vessel at the temperature of maximum density. The weight of a given volume of water under these conditions was made a subject of elaborate investigation by a committee of the Academy, and in conformity with the results obtained the standard unit of weight, called the *gramme*, was fixed at one-thousanth part of the standard weight above mentioned, which, being a thousand grams in weight, is called the *kilogramme*.

In order that the introduction of the new legal standards might not be postponed too long, the national assembly adopted the provisional meter on the 7th of April, 1795, finally by a decree of Dec. 10, 1799, the slightly modified *mètre vrai et définitif.*

With this legal act the signification of the meter as a so-called natural measure has become invalid, inasmuch as a correction of the same by means of later, more exact geodetic measurements is excluded.

We know now that the meter does not strictly bear the ratio to the size of the earth that was originally supposed. No stress, however, is laid on this quasi-insufficiency because other means of maintaining the standard unit have been resorted to. The theoretical side of the metric system, namely the creation of a natural measure that could be refound, rediscovered if necessary, was no success; neither did the practical side prove satisfactory. Men had hoped that so rational a system would be immediately accepted by all civilized nations, i. e. to see the meter the universal standard. The acceptance, however, of the metric system by other states proved to be the exception rather than the rule.

One benefit, however, accrued from the introduction of the metric system. England already had carefully prepared standards. Other states began to revise their standards. Scientists and technical experts in the various states were ordered to prepare accurate standards for comparison. Balances were also greatly improved during this time. One reason why the metric system did not find wider and more rapid application was the fact that France itself did not possess the power to make the older weights disappear. This was the fault of the French government, for in 1812 the old weights and measures were permitted to be used side by side with the new. It was in 1837 that a law was passed under Louis Philippe making the metric system obligatory after 1840. It is not surprising that measures doing things but half were not fit to remove old customs.

"History teaches" it is said, but people evidently do not learn. In 1868 Germany retained some of its old standards along with the new standards of the metric system and has, therefore, up to this day standards of two different systems. In no country, probably, was the confusion greater than in Germany. Each state, large or small, had its own system of weights and measures. The small dukedom of Schleswig-Holstein had no less than twenty-four different standards for land measure.

While the constitution of the United States authorizes Congress to "fix the standard of weights and measures", this power has never been definitely exercised, and but little legislation has been enacted upon this subject. Washington regarded the matter of sufficient importance to justify a special reference to it in his first annual message to Congress (January, 1790), and Jefferson, while Secretary of State, prepared a report, at the request of the House of Representatives, in which he proposed (July, 1790) "to reduce every branch to the decimal ratio already established for coins, and thus bring the calculation of the principal affairs of life within the arithmetic of every man who can multiply and divide." The consideration of the subject being again urged by Washington, a committee of Congress reported in favor of Jefferson's plan, but no legislation followed. In the meantime the executive branch of the government found it necessary to procure standards for use in the collection of revenue and other operations in which weights and measures were required and the Troughton 82-inch brass scale was obtained for the Coast and Geodetic Survey in 1814, a platinum kilogram and meter, by Gallatin, in 1821, and a troy pound from London in 1827, also by Gallatin. In 1828 the latter was, by act of Congress, made the standard mass for the Mint of the United States, and, although totally unfit for such purpose, it has since remained the standard for coinage purposes.

In 1830 the Secretary of the Treasury was directed to cause a comparison to be made of the standards of weight and measure used at the principal custom-houses, as a result of which large discrepancies were disclosed in the weights and measures in use. The Treasury department, being obliged to execute the constitutional provision that all duties, imports, and excises shall be uniform throughout the United States, adopted the Troughton scale as the standard of length; the avoirdupois pound, to be derived from the troy pound of the mint, as the unit of mass. At the same time the department adopted the wine gallon of 231 cubic inches for liquid measure and the Winchester bushel of 2150.42 cubic inches for dry measure. In 1836 the Secretary of the Treasury was authorized to cause a complete set of all weights and measures adopted as standards by the department for the use of custom-houses and other purposes to be delivered to the governor of each state of the Union, for the use of the states, respectively, the object being to encourage uniformity of weights and measures throughout the Union. At this time several states had adopted standards differing from those used in the Treasury department, but after a time these were rejected, and finally nearly all the states formally adopted, by act of legislature, the standards which had been put in their hands by the national government. Thus a good degree of uniformity was secured, although Congress had not adopted a standard of mass or of length, other than for coinage purposes, as already described.

The next and in many respects the most important legislation upon the subject was the act of July, 28, 1866, making the use of the metric system lawful throughout the United States and defining the weights and measures in common use in terms of the units of this system. This was the first general legislation upon the subject, and the metric system was thus the first, and thus far the only, system made generally legal throughout the country. By not doing more Congress has thereby added to our already confusing systems, rather than to remove all confusion by one bold stroke.

While the cause of the metric system was thus advanced on the one hand and checked on the other, the importance of a universal standard became more and more evident with each decade. The universality of science, the constant growth of the industries and the increasing interchange of natural products and manufactured articles demonstrated the necessity of uniform standards.

At the time of the first world's fair in London in 1851, manifold products from all the world over were brought to this city. He who desired to learn about their economic value encountered the problem of deciphering hundreds of different specifications of weights and measures. The same problems presented themselves in a still greater degree in 1855 in Paris, 1862 in London, and 1867 in Paris.

At the time of the Paris exposition in 1867, a committee representing 21 states came together and a resolution formulated by Jacobi of Petersburg was adopted stating the following conclusion: "The metric system is qualified throughout to be adopted generally on account of its scientific foundation, on account of the uniform construction of all its parts and on account of the simplicity and easiness of its application in the sciences, arts, industries and in commerce."

Soon after the exposition of 1867 the metric system was adopted by Germany and Austria, a few years later by Switzerland and the Scandinavian countries.

How intercourse has been simplified in each country and particularly between different countries since a number of states employ the same standards, how much time, labor, vexation and money has been saved, but very few people comprehend.

With the adoption of the metric system by other states, a new demand was created which resulted in the equipment of an international institute, the labors of which came to a conclusion in 1889.

As long as each state has its own system of weights and measures, it is its duty to protect the normal standards against changes and to give every person who is need of the same an opportunity to obtain weights and measures that accord with the normal standards.

No state, that has desired a good condition of its system of weights and measures has delayed to compare carefully its standards with the standards of other countries. But for the correctness of the yard England alone was responsible, for that of the meter France, for that of the Rhenish foot Prussia, etc.

Time and conditions had changed. It is true the French system had been adopted, but could France be granted the guardianship over the unchangeability of weights and measures for other states, and could France be made sole agent for accredited copies of standards?

Such a privilege was all the more unwarranted since the general faith in the correctness of the French standards issued in the past decades had become shaken through carelessness of French officials.

As a result of the conference of 1874 in which Austria-Hungary, Belgium, Brazil, Denmark, France, Germany, Great Britain, Greece, Italy, the Netherlands, Peru, Portugal, Russia, Spain, Sweden and Norway, Switzerland, Turkey, the United States of North America and Venezuela were represented, the French government invited these states to create an international bureau for measures and weights. This conference met in March and April 1875, and there was created the *Convention du mètre, signée le 20. Mai 1875.*

At the expense of the interested states, a building was purchased for 400,000 francs, in which there was established an international bureau of weights and measures, which undertook to prepare and compare the fundamental standards. This bureau worked under the directions of and was controlled by the international committee. This committee again was placed under the authority of a *conférence génerale de poids et mesures*, the members of which were appointed for each general conference by the governments interested in the work.

For the international bureau a number of distinguished scientists were secured with the excellent Dr. Ole Broch at their head, who unfortunately died shortly before the last general conference. For the home of the international bureau the French government purchased the *pavillon de Breteuil* near Sèveres directly adjoining the park of St. Cloud.

The mere fact that most civilized nations deemed it necessary to send delegates to an international conference of weights and measures in itself indicates the importance of an international adjustment of weights and measures. It is true that the most costly fabrics are not measured by the millimeter and that gold and silver are not weighed by the milligram. However, in scientific measurements and in the manufacture of exact instruments a difference of 1/10 mm. i. e. the 1/10,000 part of the meter cannot be overlooked. Besides, such measurements cannot be carried out with the original standards but with copies from copies of these standards. It is therefore apparent that the prototypes from which the copies, to be used in the sciences, the arts, and in commerce, are taken must be very exact. In order to achieve this the following rules were laid down by the international committee as a guide for the bureau:

1.) The old standards of the metric system, the *mètre* and the *kilogramme des archives*, are taken as the basis for the new international prototypes.

2.) For this purpose several copies are prepared which agree as nearly as possible with the old standards.

3.) From these copies that meter measure and that kilogram weight are selected which agree best with the old standard. These two are to be regarded thereafter as the international prototypes. The old standards henceforth have but an historic interest.

4.) The international prototypes as well as the copies to be prepared for the interested states are to be made from platinum-iridium (9—1) and are to be of the same prescribed form.

5.) For all prototypes the expansion by heat is to be determined with great exactness.

In 1889 the bureau at Breteuil, supported by various members of the committee, had succeeded so far in its task that 30 meter measures and 40 kilogram weights could be distributed as national prototypes. The money value of the metal alone is represented by 4 million francs. None of the meter measures 1—30 differ from the international prototype by 1/100 mm. The differences have been estimated up to 1/5000 mm. Of the kilogram weights not one of the national prototypes 1—40 differs from the international prototype by 1 mgr. The real difference is determined down to 1/200 mgr.

A degeneration of measures has therefore become almost impossible, since this would mean the destruction of all of the new prototypes.

The object of the last general conference was to examine and compare the national prototypes with the international prototypes and distribute the former. The national prototypes were distributed Sept. 26, 1889, by allotment. The international prototypes together with documents etc. were placed in the deepest cellar in Breteuil under threefold lock Sept. 28.

The United States received meters Nos. 21 and 27 and kilograms Nos. 4 and 20. The seals from meter No. 27 and kilogram No. 20 were broken Jan. 2, 1890 in the Cabinet room of the Executive Mansion by the President of the United States in the presence of the Secretary of State and the Secretary of the Treasury, together with a number of invited guests. They were thus adopted as the national prototype meter and kilogram.

The Troughton scale, which in the early part of the century had been tentatively adopted as a standard of length, has long been recognized as quite unsuitable for such use, owing to its faulty construction and the inferiority of its graduation. For many years, in standardizing length measures, recourse to copies of the imperial yard of Great Britain had been necessary, and to copies of the meter of the archives in the office of weights and measures. The standard of mass originally selected was likewise unfit for use for similar reasons, and had been practically ignored.

The national prototypes adopted in 1890 now serve as fundamental standards. It was doubtless the intention of Congress that they should thus be used when the international metric convention was entered into in 1875. The practical effect upon our customary weights and measures is, of course, nothing. The Office of Weights and Measures, with the approval of the Secretary of the Treasury, has adopted the national prototypes, the exact relation of which to the international prototypes is accurately known, as the fundamental standards, and the customary units—the yard and the pound—are derived therefrom in accordance with the act of July 28, 1866. *E. K.*

ORIGINAL CONTRIBUTIONS.

On the Chemical Composition of the Oil of Sassafras Bark and Oil of Sassafras Leaves.

By Dr. *Fred. B. Power* and Dr. *Clemens Kleber.*

I. Oil of Sassafras Bark.

This oil has long been recognized by the United States Pharmacopœia, and is very largely used in the United States, chiefly for flavoring purposes or for perfuming ordinary soaps. It is obtained, as is well known, by the distillation of the roots, with adhering bark, of the sassafras tree[1], which is known botanically as *Sassafras officinale* Nees, or *Laurus Sassafras* Linné, or *Sassafras variifolium* (Salisbury) O. Kuntze (Nat. Ord. *Laurineæ*).

The first chemical examination of this oil appears to have been made by Grimaux and Ruotte[2], who stated it to consist of about 90 percent of safrol and 10 percent of hydrocarbon, $C_{10}H_{16}$, which was termed safrene. They also observed the presence of an extremely small amount of phenol, which was much more recently recognized by Pomeranz[3] as eugenol, and estimated by him to be contained to the extent of 0.23 percent in the oil. Other investigations which have hitherto been made of this oil, such, for instance, as those of Saint Evre[4], Faltin[5], and Flückiger[6], relate chiefly to the action of chemical agents upon the oil or to the characters of the safrol contained therein, but without affording any further knowledge of its constituents.

As we had an opportunity some time ago of distilling a considerable amount of this oil directly from the bark[7], it seemed to us of interest to subject it to a more complete chemical study, the results of which are here presented. The yield of oil from the air-dry bark was 7.4 percent. The oil has a yellowish or reddish-yellow color, a specific gravity of 1.075 at 15° C., and an optical rotation of + 3° 16′ in a tube of 100 mm. The wood of sassafras roots, deprived of the bark, yields a comparatively small amount of oil, only 0.9 percent, but this has the same specific gravity and the same properties as the oil distilled from the root bark.

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[1] An interesting Essay on Sassafras, by the late William Procter, Jr., is contained in the Proc. Amer. Pharm. Assoc., 1866, p. 211. This relates chiefly to the history and distribution of the sassafras tree, the distillation of the oil, etc.

[2] Comptes rendus, 68 (1869), p. 928.

[3] Chemiker Zeitung, 14 (1890), Rep. p. 232.

[4] Ann. Chim. Phys., [3] 12, 107, and Liebig's Annalen, 52, p. 396.

[5] Liebig's Annalen, 87 (1853), p. 376.

[6] London Pharm. Journ., 17 (1887), p. 989, and Jahresb. d. Chemie, 1876, p. 910; 1887, p. 94.

[7] Schimmel & Co's Semi-Annual Report, October, 1893, p. 39.

In this investigation only the oil distilled by ourselves was employed. Three thousand grammes of the oil were first placed in a freezing mixture of ice and salt, in order to separate the safrol contained therein. Under these conditions, and even after rubbing the sides of the vessel with a sharp-edged glass rod, no separation of crystals took place after several hours. It was this behavior of the oil which led Grimaux and Ruotte (loc. cit.) to consider safrol as an uncrystallizable body. The crystallization of the safrol takes place, however, immediately as soon as a trace of solid safrol, which has been otherwise obtained, is brought in contact with the oil. The crystalline mass was then allowed to drain well, and, in order to separate any enclosed liquid, it was repeatedly melted, crystallized, and drained. By the subsequent fractionation of the remaining liquid portion of the oil, that fraction which was collected at 230° C. was likewise subjected to the treatment above described, and we thus obtained a total of 2340 gm. safrol, or 78 percent. With consideration of the small amount of safrol which undoubtedly still remained dissolved in the oil, the total amount of safrol in the oil may be regarded as about 80 percent. The oil, deprived as completely as possible of safrol by exposure to cold, was then shaken with a 2 percent solution of sodium hydrate until nothing more was taken up by the latter, the alkaline solution freed from any suspended drops of oil by shaking it with ether, then acidulated, and again extracted with ether. By the careful evaporation of the latter, 15 gm., or 0.5 percent, of a yellowish oil was obtained, the odor of which indicated it to consist of eugenol, and, as previously stated, this had already been recognized as a constituent of sassafras oil. For the more exact identification of this body, it was converted into the benzoate, according to the method of Schotten-Baumann, and was found to yield very readily a body which crystallized from alcohol in handsome, compact prisms, having a melting point of 69° C., and thus, as was expected, consisted of pure eugenol benzoate.

The oil freed from eugenol was subjected to repeated distillation, when about one-half of it passed over between 155° and 175° C., and of this the greater portion distilled between 155° and 160° C. From the latter a nitrosochloride was readily obtained, and from this in turn the benzylnitrolamine of pinene, melting at 123° C. The small fraction distilling between 160° and 175° C. contained an abundance of phellandrene, which was identified by the formation of its nitrite. A small portion distilling between 170° and 175° C. was especially tested for the possible presence of cineol and dipentene, for these two bodies are known to be constituents of camphor oil[8], and, as our subsequent summary of the constituents of sassafras oil will show, the latter closely resembles camphor oil in its qualitative composition. The tests for these bodies were, however, attended with negative results, for by leading gaseous hydrobromic acid into the well-cooled solution of the respective fraction in petroleum ether no crystalline compound was formed, nor could a solid bromide be obtained. The body to which the name of safrene has been given by earlier investigators, and to which we have already referred, thus appears to consist simply of a mixture of a large amount of pinene with some phellandrene.

The portion of the oil which distilled at first between 175° and 200° C. became resolved by further fractionation into bodies of lower and higher boiling points. At a temperature above 200° C. an abundance of crystals separated in the tube of the condenser, and the distillate itself formed a thick mass on cooling. When deprived of liquid by means of a filter pump, an abundant amount of white crystals was obtained, which, from their appearance and odor, were recognized as camphor. Their alcoholic solution was strongly dextro-rotary, they could readily be sublimed, and afforded with hydroxylamine a handsomely crystallizable oxime, having a melting point of 115° C. This body was therefore positively identified as dextro-rotary camphor, a constituent of the oil which has been overlooked by previous investigators.

The portion of oil which distilled between 200° and 260° C. could be separated almost completely by fractionation and crystallization into camphor and safrol. From the thick, resinous residue which remained at a temperature above 260° C. we obtained subsequently a small fraction distilling between 260° and 270° C. In this the presence of cadinene was presumed, as it gave in glacial acetic acid solution with a trace of sulphuric acid the violet coloration which is characteristic for this sesquiterpene. It was therefore diluted with ether, and saturated with gaseous hydrochloric acid, when, as is usual in the presence of cadinene, a deep violet coloration ensued, but on evaporation no solid hydrochloride was obtained. It is possible that this negative result was due to the presence of impurities, as on account of the very small amount of this fraction its thorough purification was impossible, and the presence of this sesquiterpene must therefore be left in doubt.

In order, finally, to determine the amount of camphor present in the oil, it was converted, by reduction, into borneol, and the latter then estimated in the form of its acetic ester. For this purpose 20 gm. of the oil were dissolved in absolute alcohol, and 5 gm. of metallic sodium gradually brought into the liquid at the boiling temperature. After the complete solution of the sodium a considerable amount of water was added, and the separated oil was boiled for an hour with acetic anhydride and a little anhydrous sodium acetate. The resulting liquid was then washed with water, and subsequently with a solution of sodium carbonate until perfectly neutralized, then dried by means of calcium chloride and filtered. On saponification with an alcoholic normal solution of sodium hydrate, 7.4 cc. of the latter were required for the saponification of 17.55 gm. of the acetylized oil, which would correspond to 6.8 percent of camphor in the original oil.

From the results of this investigation the constituents of the oil of sassafras bark, and the relative proportions in which they are contained therein, may be summarized as follows:

Safrol	$C_{10}H_{10}O_2$,	about 80.0%
Pinene	$C_{10}H_{16}$	" 10.0%
Phellandrene	$C_{10}H_{16}$	
Camphor, dextrogyrate	$C_{10}H_{16}O$,	6.8%
Eugenol	$C_{10}H_{12}O_2$,	0.5%
A high boiling portion, consisting of:		
Cadinene, $C_{15}H_{24}$ (?), and residue		about 3.0%
		100.3

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[8] Schimmel & Co's Bericht, April, 1889, p. 9.

In this summary the marked similarity in the qualitative composition of sassafras oil and camphor oil is apparent, the latter containing in addition small amounts of cinol and dipentene. This similarity in the composition of the two oils is, however, not surprising, in view of the fact that the sassafras and camphor trees belong to the same plant family, and in the classification of Linné were included in the same genus.

II. Oil of Sassafras Leaves.

It is quite well known, and has already been recorded by the late Professor Flückiger[9], that the leaves of the sassafras tree, when crushed, develop a finely aromatic odor, not at all reminding one of safrol. It was, indeed, chiefly upon the instigation of Professor Flückiger, during a visit to the laboratories of Messrs. Fritzsche Brothers, at Garfield, N. J., in the summer of 1894, that we were led to undertake the distillation and examination of this oil. The material for this purpose was collected in the immediate neighborhood of the factory at Garfield, and a preliminary notice of the oil was given in the Semi-Annual Report, October, 1894, p. 71, of Messrs. Schimmel & Co. As there stated, the yield of the oil is exceedingly small, amounting to but 0.028 percent of the weight of the fresh leaves, of which we distilled over 8000 pounds.

As we are not aware that this fragrant oil has ever been obtained heretofore, or at least in an amount sufficient for its chemical examination, it has been to us a subject of special interest.

The oil possesses a light yellow color and an exceedingly agreeable, somewhat lemon-like odor. Its specific gravity is 0.872 at 15° C., and its optical rotation $+ 6° 25'$ in a tube of 100 mm.

On shaking the oil with a solution of sodium bisulphite a considerable amount of a solid compound separated out, which, however, on gently heating, showed an inclination to liquefy. This behavior indicated the presence of citral. To confirm this the bisulphite compound was pressed, washed with ether, and decomposed, when an oil was obtained having an intense lemon-like odor, and this, when treated with pyroracemic acid and β-naphtylamine, readily yielded the cltryl-β-naphtocinchoninic acid, melting at 196° C. The lemon-yellow laminæ of this compound, when observed under the microscope, showed characteristic forms.

The oil deprived of this aldehyde, and washed with a solution of sodium carbonate, could not be completely distilled without decomposition, either under ordinary pressure or in a vacuum. A constant elimination of water took place, the distillate had an acid reaction, and the more volatile portion of the distillate contained a considerable amount of dipentene, which was identified by means of its tetrabromide. This behavior pointed to the presence of a readily decomposable ester. The oil was therefore saponified with an alcoholic solution of potassium hydrate, and the product distilled with steam. There remained a considerable amount of a thick residue, which, on cooling, solidified to a butter-like mass. It dissolved in a warm mixture of alcohol and ether, and, on cooling, again solidified to a magma of thin laminæ. These were again re-crystallized several times from a mixture of ether and alcohol, and finally showed a melting point of 58° C. The entire appearance of this body, as also its resistance toward the ordinary reagents, even warm sulphuric and nitric acids, left no doubt as to its identity as a paraffin. It could naturally not be determined whether it represents a single substance, for it is well known that it is hardly possible to purify or separate the paraffins completely by simple re-crystallization. The mother-liquor from the paraffin contained, furthermore, a considerable amount of a thick, oily body, which only distilled at a very high temperature, with accompanying decomposition, and which apparently consisted of polymerized and resinified products of terpenes.

From the aqueous, alkaline solution which remained after the distillation with steam the acids were liberated by means of dilute sulphuric acid and distilled by steam. Some oily drops were obtained in the distillate, which, judging from their odor, as also that of their ethyl ester, consisted of iso-valerianic acid. The remaining distillate, after being neutralized and concentrated, was fractionally precipitated by silver nitrate. After separating the first precipitate, there was thus obtained the silver salt of acetic acid.

0.2387 gm. of the silver salt afforded 0.1532 gm. of silver, corresponding to 64.2 percent.

Silver acetate contains 64.7 percent of silver.

The saponified oil which had been distilled by steam, as previously described, was subjected to fractional distillation under a pressure of about 25 mm. It was thus resolved into essentially three fractions, having the boiling points respectively of 60 to 80°, 100 to 120°, and 135 to 140° C. In the first fraction both pinene and a considerable amount of phellandrene could easily be detected by means of their respective benzylnitrolamine and nitrite compounds. Furthermore, the odor and taste of this fraction also indicated the presence of the aliphatic terpene, myrcene (with three double bonds), which had previously been isolated by us from bay oil[10]. Unfortunately, no reactions are as yet known for the certain identification of this body, although its presence in this oil is made very probable for the following reasons:

1. By the slow distillation of this terpene fraction under ordinary pressure only a portion passed over below 200° C., the remainder forming a thick oil which only distilled at a temperature above 300° C., with partial decomposition.

2. When gently heated for half an hour with glacial acetic acid and a trace of 50 percent sulphuric acid, the fraction acquired the unmistakable odor of linaloyl acetate, a behavior which is characteristic for myrcene.

3. Two fractions which were collected in the neighborhood of 70° C., under a pressure of 25 mm. possessed the following physical constants:

Fraction I. Spec. grav. at 18.5° 0.8429, $[\alpha]_D=$ 1.4734, M_D[11] 45.29; fraction II. spec. grav. 0.8395, $[\alpha]_D$, 1.4760, M_D 45.69. The specific gravity is thus lower than that of any of the known terpenes, and that of myrcene we have previously found to be 0.8006 at 15° C. On the other hand, the molecular refraction is higher than may be calculated for even a terpene with two double bonds ($M_D=45.24$), although the presence in this case of pinene, which only contains one double bond, must naturally diminish the refraction.

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[9] Pharmakognosie des Pflanzenreiches, 3d edit., p. 452.

[10] Pharm. Rundschau, March, 1895.

[11] Calculated according to the n^2 formula.

The fraction 100 to 120° C. distilled, for the most part, under ordinary pressure at about 200° C. By its odor, as also that of its acetic ester, it was unmistakably recognizable as linalool. Furthermore, by gentle oxidation with a chromic acid mixture we readily succeeded in converting it into citral, which in turn was further identified by its conversion into the characteristic citryl-β-naphto-cinchoninic acid.

The third fraction (135 to 140° C.) distilled under ordinary pressure at 230° C., and its odor indicated it to consist of geraniol. We succeeded also in obtaining therefrom, after prolonged treatment with anhydrous calcium chloride, the compound which is characteristic of this alcohol.

For the quantitative estimation of the linalool and geraniol, which are evidently contained in the oil both in the form of the acetic ester and in the free state, the following experiments were conducted: 19.19 gm. of the oil required for saponification 2 to 3 cc. of alcoholic normal solution of sodium hydrate, which would correspond to 2.4 percent of linaloÿl- and geranylacetates. On the other hand, after boiling the oil for one hour with an equal volume of acetic anhydride and a little anhydrous sodium acetate, 14.36 gm. of the acetylized oil required for saponification 10.7 cc. of normal alkali, corresponding to 12.1 percent of the alcohols linalool and geraniol, $C_{10}H_{18}O$. It should, however, be noted in this connection that the actual percentage is probably considerably higher, for it has been shown by investigations conducted in the laboratories of Messrs. Schimmel & Co., Leipzig (see Bericht, April, 1893, p. 36), that the acetylization of linalool is not by any means quantitatively effected.

The small residue which remained above 140° C., under a pressure of 25 mm., afforded the color reaction of cadinene, but, as in the case of the oil from sassafras bark, a solid hydrochloride could not be obtained therefrom.

The oil of sassafras leaves, therefore, contains the following bodies:

Pinene	$C_{10}H_{16}$
Myrcene (?)	$C_{10}H_{16}$
Phellandrene	$C_{10}H_{16}$
Linalool	$C_{10}H_{18}O$
Geraniol	$C_{10}H_{18}O$
The Acetic and Valerianic Esters of these alcohols,	$C_{10}H_{17}—C_2H_3O_2$ and $C_{10}H_{17}—C_5H_9O_2$
Cadinene (?)	$C_{15}H_{24}$
A paraffin	C^nH^{2n+2}

In the two oils here described we have a striking and interesting sample of the fact, which has repeatedly been observed in other instances, that different parts of the same plant may produce essential oils which are fundamentally different in their chemical composition.

Laboratory of Fritzsche Bros., Garfield, N. J.

The Pasteurization of Milk.

By Dr. *H. L. Russell.*

The present agitation concerning the purity of food products is a question of paramount and ever-increasing interest. Although its influence is being felt in all of the industries concerned with the preparation of food stuffs yet in no one line is it more intense than in the dairy business.

Much attention is being paid to the different forms of adulteration and sophistication of foods, but there is another phase of the question, the importance of which has often been overlooked, and that is, the contamination of milk, especially by bacteria, harmful or innocuous, that gain access to the same from the time it is drawn from the cow until it is consumed.

In some respects the importance of this is far greater than in the case where the butter fat is abstracted by skimming, or water is added to the milk, for the addition or withdrawal of these elements does not render the milk especially harmful, while the presence of many kinds of bacteria changes the chemical nature of the milk, often greatly impairing its nutritive value. In one case the customer is cheated by his failure to receive that which he supposes he has bought; in the other he may be drugged with the by-products that ofttimes possess violent toxic properties. Milk is so admirably adapted to the development of bacterial life that unless special precautions are taken, it invariably becomes highly contaminated with these living organisms that work over its material, multiplying incessantly and forming by-products of their growth that develop the different fermentations that are to be noted in this fluid.

The actual number of bacteria found in milk varies greatly from time to time, but the entrance of a few will in a short time suffice to produce the most profound changes possible. The early presence of bacteria in milk is almost invariably associated with dirt and filth, more especially in the milking and immediate handling of milk subsequent thereto. If carelessness prevails at this time the milk is filled with numerous organisms that are derived from the dust of the barn, filth, animal excreta, and numerous other sources.

Ordinarily we think of sewage as a substance incomparably rich in bacterial life, but much of the milk that is consumed by us on our tables actually contains a larger number of living germs than are to be found in sewage. The kind of bacteria present in each, is, of course, somewhat different, but even in milk there are almost invariably found micro-organisms derived from the intestinal tract of animals that do not differ in any material way from the same kind of germs that inhabit the human digestive tract.

We may roughly classify the bacterial life in milk, for our present purpose, into three groups. First,—The normal milk bacteria that are concerned in the usual fermentative processes (souring, etc.) and which are not in any special degree harmful. Second,—Bacteria that are not disease-producing themselves but which are able to form by-products of a harmful nature when ingested by the susceptible individual. Undoubtedly many of the infantile diseases like dysentery and summer complaint are produced by this class of germs. Third,—Bacteria capable of producing disease, that may be derived either from the animal herself, as in tuberculosis, or which may obtain an entrance into the milk after it is milked and there find favorable conditions for growth, as in typhoid fever and diphtheria.

The elimination or keeping out of all kinds of bacteria will unquestionably have a very beneficial effect, as not only the normal and abnormal fermentative processes will be stopped, thus improving the keeping quality of the milk, but the hygienic value of the material will be much greater when this freedom from harmful germs is established.

To accomplish this desirable result, two methods have been suggested, the first of which is to exclude, as far as possible, the entrance of bacteria into the milk. By using the greatest care in securing the milk and the subsequent handling of the same, its bacterial content is greatly reduced. This improves its keeping quality very materially, and the great care taken in its handling will lessen the danger from disease germs that are derived from extraneous sources. To determine its freedom from tuberculosis, herds are tested with tuberculin, and the milk of all animals reacting to this test is excluded from the general supply; milk secured under such careful conditions is a perfectly natural product and is practically in the same condition as it was in the udder of the animal. The difficulties, however, in obtaining such a product are very great and it requires much care and watchfulness that necessarily involves considerable expense. Milk so handled is often called "certified milk" and where it has been introduced it has given much satisfaction. When handled in this way, it is, at least theoretically, the most perfect product that can be secured, but the practical difficulties are such that other methods involving less expense are greatly desired.

The attempt has been made to secure the same result in another way, that is, by the destruction of the contained bacteria, in whole or in part, by means of agents that do not injure the nutritive value of the milk. For this purpose heat has been most extensively used. It is applied in two ways,—

1. Sterilization, where the milk is heated to a temperature at or near the boiling point for a considerable length of time. By this method all of the bacterial life in the milk is affected more or less, the micro-organisms in the vegetative condition being entirely destroyed and the more resistent spores killed or weakened to such an extent that their power of development is much diminished. Milk so treated has its physical and chemical characteristics altered somewhat, there being a pronounced cooked taste which is objectionable to some. This method, as a rule, involves the use of superheated steam so that the apparatus designed for the purpose must be strong and well made, and therefore too expensive for use except on a large commercial scale.

A modification of this method, applicable in a small way, is the sterilizing of milk in ordinary streaming steam. In this instance, the milk is merely subjected to the temperature of boiling water, therefore, the disinfecting action of the steam is not nearly so great as it is where this agent is subjected to pressure. As an illustration of a simple arrangement that is applicable for this purpose the Arnold sterilizer, a cut of which is shown in figure 1, may be mentioned.

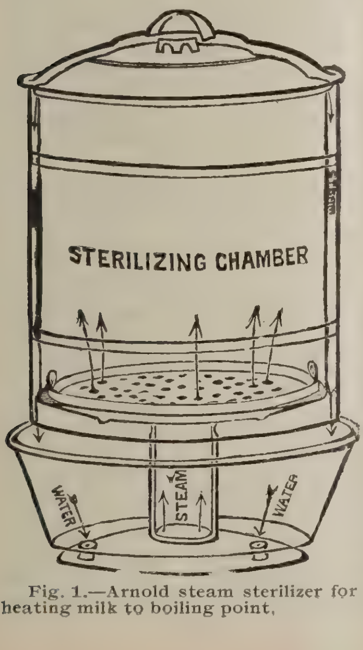

Fig. 1.—Arnold steam sterilizer for heating milk to boiling point.

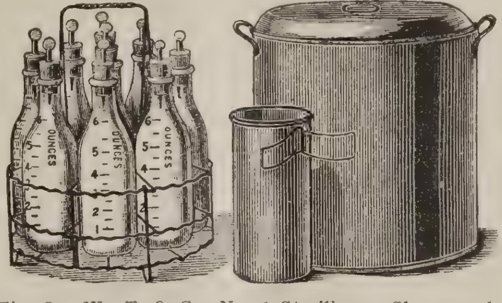

Fig. 2.—W., T. & Co. No. 1 Sterilizer. Shows a device where the bottles are graduated and closed with perforated rubber stoppers. The glass plug can be withdrawn so as to allow the expelled gases to pass off.

2. Pasteurization, so named in honor of Pasteur, who applied the principle to the heating of wines to prevent after-fermentations, consists in the application of a much lower degree of heat for a shorter time. The high temperature is maintained long enough to destroy the developing bacteria, but no attempt is made to kill the spore-bearing forms that are always able to withstand a much severer treatment.

The conditions, as to temperature and time, under which the vegetating bacteria are destroyed by heat vary with different kinds of germs. As a rule, exposure to a temperature of 130—135 degrees F. for ten minutes is usually fatal, but some bacteria, notably the tubercle bacillus, are able to withstand a higher temperature. Inasmuch, as the danger from this particular species is greater than from any other disease form, the minimum limit selected is the maintainance of a sufficient heat for a sufficient time to destroy this organism.

The highest available temperature should be below that at which the milk acquires a permanently cooked taste. This gives some latitude in heating as the milk may then be treated for thirty or forty minutes at 148 to 150 degrees, or by increasing the temperature, the same effect may be produced at 160 degrees for ten or fifteen minutes. In our experience, a medium standard has been taken, 155 degrees for fifteen or twenty minutes. Mistakes in quick and accurate thermometer readings, or in the accuracy of instruments are liable to occur and if a medium standard is selected danger from overheating is less.

While the heating process is essential in destroying the vegetating bacteria, it is quite as necessary that the product should be immediately cooled and thoroughly chilled, so as to prevent the germination and growth of the spores that are not destroyed by the heat. The temperature at which the milk is stored after pasteurization largely determines the keeping quality of the product; the lower the temperature the slower the development of the contained bacteria and the less rapid the subsequent changes in the milk. If the milk has been properly handled and stored in an ordinary refrigerator, it will usually keep sweet from three to six days; in many instances, we have had samples treated in the ordinary way that remained sweet from two to three weeks.

The relation of the temperature changes that take place during the pasteurizing and cooling of the milk to the growth of bacteria can best be illustrated in the following figure.

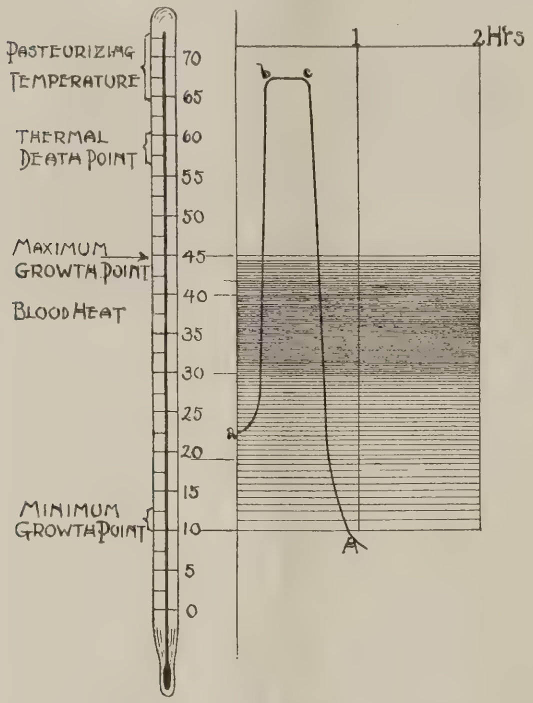

Fig. 3.—Diagram showing temperature changes in milk subjected to the pasteurizing process and the relation of the same to the growth of bacteria.

Bacterial development occurs between 10—43° C.; the most rapid growth being designated by deeper horizontal shading. The black line aA indicates the temperature changes in pasteurizing; a to b the heating process, b to c the maintainance of a proper temperature and c to A the cooling. The necessity of rapid cooling of the milk to a temperature below the germination point is apparent.

The principle of pasteurization can be applied to the preparation of milk in small quantities for family use, or in specially designed apparatus to be used on a large commercial scale. A contrivance suitable for the first purpose is shown in fig. 4. In its construction nothing is needed that will not be found in any well ordered kitchen, except a thermometer.*

The capacity of these family pasteurizers is, however, necessarily limited, and to prepare the product on a commercial scale especially designed apparatus is recommended. Many different devices for this purpose have been suggested but the great majority of them have been constructed from a falsely economical standpoint, which is the treatment of the largest possible amount of milk in the shortest possible time, without any special reference to whether all of the milk has been sufficiently heated for the proper time to destroy not only the organisms of fermentation but any possible disease germs that might be present.

It is not our purpose to enter into a discussion of the different devices that have been constructed for this purpose. The fundamental principles involved in the best machines may be briefly included in the following generalizations:—

1. The apparatus should be constructed so that all of the milk can be heated for a definite length of time at a definite temperature.

2. All parts of apparatus should be easily accessible so that they may be thoroughly cleaned and sterilized.

3. The apparatus should be as simple as possible in construction, economical in use, and the milk should be protected during the pasteurizing process and subsequently from reinfection.

The salient advantages that commend pasteurized products to the consumer are two-fold.

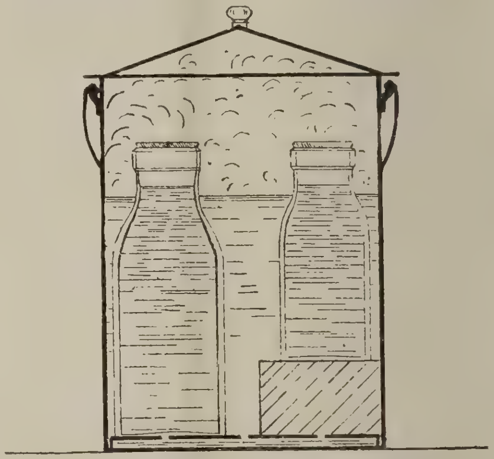

Fig. 4.—A simple arrangement for pasteurizing milk for family use. A covered tin pail will serve as a receptacle for bottles and water. A shallow bench on which to set the bottles to keep them from "bumping" may be made from a tin plate punched full of holes. An inverted bowl or block will serve to equalize level of milk in different sized bottles where such are used. Cover is removed when temperature of water is taken. Bottles may be closed with a clean pulp cap or clean cotton batting.

1. Enhanced keeping quality: In city trade the daily milk supply must be brought from the country districts, often from long distances, so that a number of hours elapse before the milk is placed in the hands of the consumer. During transportation it must be handled a number of times, and only at considerable expense can it be kept below a temperature at which bacterial growth takes place. The inevitable result of these conditions is that the "life" of the milk in the hands of the consumer is very short so that considerable loss is occasioned by the souring of the same. The souring changes are due to the decomposition of the milk sugar under the influence of the lactic-acid-producing bacteria. These organisms, as a rule, do not form spores so they succumb readily to the action of heat. On this account pasteurized milk has the very evident advantage that it keeps enough better than raw milk to justify its use.

2. Freedom from noxious bacteria: While the economic advantage of pasteurized milk appeals to the consumer, the hygienic and sanitary importance of the same outweighs all other considerations. In its preparation, it is heated sufficiently high to destroy the seeds of such diseases as consumption, typhoid fever, cholera, and the like, but still not enough to injure its nutritive value.

Its use with infants and invalids is especially to be commended, as numerous testimonials from our records will show. During the past two years pasteurized milk has been sold on physicians recommendation in this city, and we have yet to learn of a single case where its use has been attended with unfavorable results. In a number of instances it has been used with great success as a *dernier resort* with ailing children where many other prepared foods had failed to afford proper nutriment. Of especial value is it in case of intestinal troubles of infants, as it possesses all of the necessary ingredients of a perfect food and in a condition perfectly free from any organisms of a baneful character.

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* Persons desiring fuller knowledge concerning the pasteurization of milk will find in Bulletin 44 of Wisconsin Agricultural Experiment Station (a copy of which will be sent upon application to the Station) further details concerning manipulation of apparatus, etc.

A careful study of the different germs found in pasteurized milk, as prepared at the University of Wisconsin creamery, as to their toxic properties, has not revealed a single form that is dangerous in any way.

It should be observed in closing, that while the process of pasteurizing is extremely simple it must be carried out under the closest supervision to give uniformly successful results.

No more fallacious idea could be gained than that any kind of milk can be successfully treated by this process. The fewer bacteria there are in the milk the less spores there will be, so that fresh milk that has been cooled thoroughly is best suited for this purpose.

Wisconsin Agr'l Expt. Station.

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Common Salt Mixture.

Several years ago a number of objects of considerable historic interest were presented to the University of Wisconsin, School of Pharmacy, by Mr. E. Sumner of Madison, Wis. Among these were several war relics from Camp Randall west of the city. In addition to the barracks for Wisconsin volunteers a hospital for wounded soldiers was located at the camp. Many a story has been told and recorded about Camp Randall, but that something of pharmaceutical interest could be associated with the camp possibly occurred to no one until a few years ago several relics were discovered in a corner of the third floor of one of the drug stores of this city.

Two of the objects referred to are reproduced by the accompanying cut showing a large pasteboard box and a smaller tin box. The former bears the label of Edward R. Squibb, M. D., Brooklyn, N. Y.; the latter that of the U. S. A. Medical Dept. Contents and purpose of contents are best explained by the label of the larger box. It reads as follows:

Chlorinium.

The Common Salt Mixture.

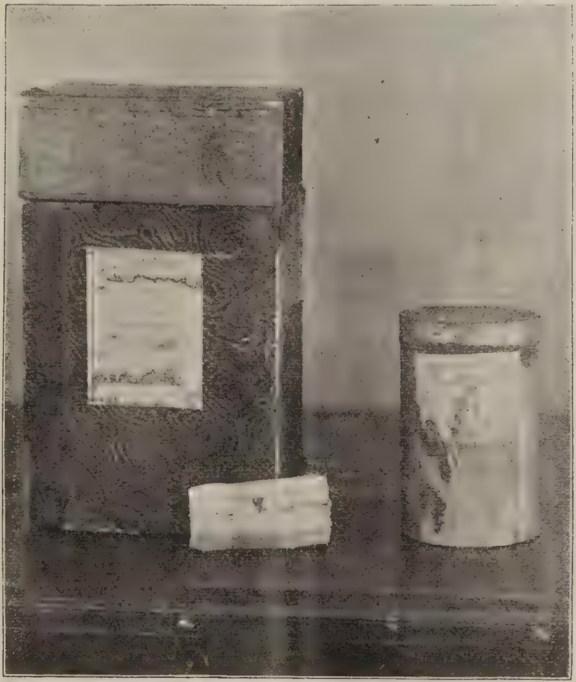
Take of common Salt, well dried........1800 parts,
Binoxide of Manganese, containing 72 percent..1875 parts,

Grind them together into a fine powder and put the powder up in packages containing about 195 grains each and put 130 packages into a pasteboard box to accompany the Sulphuric Acid Mixture.

Each of these packages requires half a fluidounce of Sulphuric Acid Mixture, and yields about 57 cubic inches of Chlorine. This quantity when thus liberated gradually in a space containing about 20,000 times its volume of air, is borne without inconvenience by persons generally, and is not injurious, even in pulmonary diseases. As very much depends upon the ventilation of apartments wherein it is to be used no absolute rules of application can be laid down except that it should never be used in such quantities as to produce discomfort or bronchial irritation to patients.

Directions for Use.

One of the above packages or papers of the Common Salt Mixture placed in a saucer or plate and thoroughly mixed with half a fluidounce of the Sulphuric Acid Mixture is to be placed under every alternate bed at night and allowed to remain there three days. Upon the second night the beds which were omitted the first night should be supplied in the same way for the same length of time; and the whole process repeated at the end of three days or sooner according to circumstances. Should the wards be badly ventilated or contain many sloughing wounds, or be subject to epidimic disease or low forms of fever, the process should be continuous; that is, the mixtures should be renewed every third day. Otherwise once or twice a month may be sufficient. And, when thorough cleanliness and ventilation are attained the process is unnecessary for occupied wards.



In disinfecting unoccupied Wards, Water Closets, Latrines, etc., by Chlorine they should first be cleansed, be closed up as perfectly as practicable, and two packages used for each 600 cubic feet of space.

Prepared by
Edward R. Squibb, M. D.,
Brooklyn, N. Y.

The mixture was put up in packages of ten powders held together by a strip of blue paper, and sealed as indicated in the cut. Thirteen packages of ten powders each were contained in a drawer-like compartment taking up about one-third of the pasteboard box. The other two-thirds, or a space of 5′x5′x13′ was allowed for the bottle containing the sulphuric acid. From the only box that was saved (the others had been used for disinfecting purposes during the past thirty years,) the acid bottle had been removed. The label of the tin box reads as follows:

132 Papers
U. S. A. Medical Dept.
Prepared at the
U. S. A.
Laboratory.
Philadelphia,
Pa.,
1864.
Experientia et Progressus.

The character of the stamp or trade mark becomes apparent from the cut. The explanatory description is but an abstract of the other label.

The box, however, did not contain 132 papers as the label would indicate, but the powder in bulk and a small tin cup or ladle. Tin box plus contents weighed 3 lbs. 12 oz. The capacity of the spoon is ½ oz. of mixture. *E. K.*

TRANSLATIONS.

Remedies from the Animal Kingdom in use Formerly and at the Present Time.*

By *B. Seybold.*

In the year 1890, at the international medical congress at Berlin, much attention was attracted by the exhibition of Chinese medicaments by the firm of J. D. Riedel. Especially surprising to most persons were the several repulsive-looking remedies of animal origin there shown, and undoubtedly many of the spectators, proud of our present day culture, thought it fortunate that such things are unknown in our civilized countries.

But how long ago is it since our materia medica overflowed with all possible and many impossible remedial agents from the animal kingdom? Upon looking over old official price-lists, pharmacopœias, and other writings pertaining to medicines, we can obtain a fair idea of the extent to which these articles were used. Such remedies were in vogue in the oldest times of which we have any record. According to Berendes[1] the remedies from the animal kingdom played no small part among the ancients; Hindoos, Persians, Egyptians, Arabs, and Romans employed a large number, some of them extremely nauseating in character. Fewer were found among the Jews, and among the Greeks at the time of Hippocrates.

To show the number of remedies of animal origin used, a compilation from old price-lists and pharmacopœias, dating from the 16th to the 19th century, is here added:

Price-lists of	No. of remedies.	Of these were fats.
1564 Marburg	35	17
1582 Worms	116	38
1600 Helmstädt	96	31
1604 Liegnitz	68	31
1605 Mainz	56	36
1607 Schweinfurt	113	38
1611 Wittenberg	75	29
1612 Henneberg	70	32
1614 Schweinfurt	110	41
1617 Marburg	79	27
1618 Langingen	72	28
1623 Rinteln	68	23
1626 Frankfurt	80	30
1633 Görlitz	119	39
1644 Schweinfurt	112	34
1652 Dresden	190	58
1656 Marburg	120	41.
1669 Leipzig	127	37
1684 Augsburg	87	30
1696 Erfurt	84	25
1745 Lübeck	111	29
1746 Brandenburg	105	29
1768 Erfurt	73	23
1770 Lübeck	98	22

Pharmacopœias contained:

1638	Pharm. Parisiensis	34 remedies.
1666	Dispensatorium Norimbergense	113 "
1672	Pharm. Augustana c. animadvers. Zwelferi	83 "
1731	Disp. reg. et electoral Boruss. Brandenburg	117 "
1732	Pharm. Parisiensis	90 "
1747	Disp. reg. et electoral Boruss. Brandenburg. Erfordiæ	97 "
1784	Pharm. Edinburgensis. Additament adpecit Baldinger Bremæ	48 "
1798	Pharm. Wirtenbergica edit. VI	107 "
1829	Pharm. Boruss. edit. V	18 "
1833	Pharm. Hanovera nova	19 "

From these statements can be seen how considerable a number of remedies were furnished apothecaries by the animal kingdom. A very large increase in number can undoubtedly be ascribed to the Thirty Years' war, for through it all nationalities were thoroughly mixed, and superstition, to which most of the remedies owed their application, was widely spread.

It may be a surprise to many, to learn that as late as 1776, a remedy, *meloe majalis*, was introduced into medicine, and that Frederick the Great, probably one of the most educated men of his day, bought this remedy from a peasant for an enormous sum; it was supposed to cure hydrophobia, and Frederick caused the remedy to be made publicly known. Even as late as the end of last century, a large number of these substances were still to be found in the pharmacopœias and official price-lists. For these reasons we can easily understand why even now such articles are called for in apothecary shops, and not only is it the lower classes who adhere to the use of such remedies; even in the higher walks of life do we find people still clinging to these superstitions.

The following list of remedies are taken from the above-named books, the large number of fats being first considered:

Axungia alcis,	fat from elks.
" agnina,	" " lambs.
" anatis,	" " ducks.
" anatis silv.,	" " wild ducks.
" anguillae,	" " eels.

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* From Apoth. Zeitung, No. 5, 1896. Translated for the Review by Richard Fischer, Instructor in Practical Pharmacy, University of Wisconsin.

[1] Berendes, Die Pharm. bei den alten Kulturvölkern.

Axungia anseris,	fat from geese.
“ apri,	“ “ wild boar.
“ ardeae,	“ “ bitterns.
“ canis,	“ “ dogs.
“ “ marini,	“ “ seals.
“ capreae,	“ “ goats.
“ ciconiae,	“ “ storks.
“ caponis,	“ “ capons.
“ castorei,	“ “ castors.
“ castoris,	“ “ beavers.
“ cati silvest.,	“ “ wild cats.
“ cervi,	“ “ deer.
“ coturnicis,	“ “ quails.
“ cuniculi,	“ “ rabbits.
“ cygni,	“ “ swans.
“ equi,	“ “ horses.
“ equorum de collis,	“ “ necks of horses.
“ erinacei,	“ “ hedgehogs.
“ felis,	“ “ cats.
“ gallinae,	“ “ chickens.
“ hirci,	“ “ bucks.
“ hominis,	human fat.
“ leonis,	fat from lions.
“ leopardi,	“ “ leopards.
“ leporis,	“ “ hares.
“ lucii,	“ “ pickerel.
“ lupi,	“ “ wolves.
“ muris montani,	“ “ marmots.
“ mustellae piscis,	“ “ burbots.
“ oculorum cervi,	“ “ eyes of deer.
“ de phasanis,	“ “ pheasants.
“ porci,	“ “ hogs.
“ serpentum,	“ “ snakes.
“ simiae,	“ “ monkeys.
“ struthio cameli,	“ “ ostriches.
“ sturionis,	“ “ sturgeons.
“ tarvae,	“ “ bustards.
“ tauri,	“ “ cattle.
“ taxae,	“ “ she-badgers.
“ taxi,	“ “ he-badgers.
“ thymali,	“ “ “Aschenschmalz.”
“ ungularum bovis,	Neatsfoot oil.
“ ursae,	fat from she-bears.
“ ursi,	“ “ he-bears.
“ viperae,	“ “ snakes.
“ vulpis,	“ “ foxes.
“ vulturis,	“ “ vultures.
Butyrum caprinum,	Butter from goat's milk.
“ foeminarum,	“ “ woman's milk.
“ majale,	“ made in May.
“ vaccininum recens,	Fresh butter.
Medulla agnina,	Marrow from lambs.
“ asinina,	“ “ donkeys.
“ capreolina,	“ “ roes.
“ caprina,	“ “ goats.
“ cervina,	“ “ deer.
“ equi,	“ “ horses.
“ hircina,	“ “ bucks.
“ hominis,	“ “ man.
“ taurina,	“ “ cattle.
“ vaccinina,	“ “ cows.
“ vervecina,	“ “ wethers.
“ vitulina,	“ “ calves.
Oesypus,	Wool fat.

Sebum caprinum,	goat-	tallow.
“ cervinum,	deer-	“
“ de dromedario,	dromedary-	“
“ hircinum,	buck-	“
“ hoedium,	kid-	“
“ ovinum,	mutton-	“
“ taurinum,	ox-	“
“ vaccininum,	cow-	“
“ vervecinum,	wether-	“
“ vitulinum,	calf-	“

Whether our ancestors were very happy when they had a dozen or more of these fats on hand is extremely doubtful.

At the head of all was the royal apothecary-shop of Dresden. The rarest things were there obtainable. Unfortunately, the catalogue gives us no information on the price of these rarities.

In enumerating all other remedies furnished by the animal kingdom, some notes are added pertaining to their collection and uses.

Aegagropilae,	Chamois excrement.
Album graecium,	White dog- “
Ambra grisea,	Amber.[2]
Apes combustae et siccatae,	Incinerated and dried bees.
Aranea,	Spider.
Aselli seu Millepedes,	Sow bug.[3]
Bezoar,	Bezoar.[4]
Blatta byzantina,	Indian muscle-shells.
Bufones exiccatae et ustae,	Dried & incinerated toads.[5]
Cancer fluviatil. usta,	Incinerated river lobster.
Cancer marin. usta,	“ sea “
Cantharides,	Spanish flies.
Capo,	Capon.
Carabus praeparat.,	Carabid.
Carnis animalium,	Meat.
Caseus mollis,	Soft cheese.
Castoreum,	Castor.[6]
Catellus,	A young dog.
Cera citrina,	Yellow wax.
Cera virginea,	Virgin wax.
Cerebella passerum,	Sparrow's brain.

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[2] Lonicer says: “Es schreiben auch etliche, dass die Ambra in der Tiefe des Meeres wachse und bei Sturm ans Land geworfen werde. Andere schreiben, es habe besondere Quellen, darinnen sie gefunden werde, gleichwie der Schwefel und Pech seine Quellen hat. Diese Ambra isset der Wallfisch einer, so Azelus wird genennet, so derselbigen ganz begierig nacheilet, und sich also daran überisset und überfüllet, und dass er daran stirbt, und auf dem Wasser liegen bleibt. Diess wissen die Fischer und haben Acht darauf, und ziehen ihn zu Land, hauen ihn auf und nehmen also die Ambra aus ihm.” See also Peters, Vol. II., p. 27.

[3] Dried sow-bugs (slaters) were extensively used to cure sore-throat, urinary calculus, and retention of the urine. As late as the beginning of this century they are found in some of the price-lists.

[4] See also Peters, Vol. II., p. 50.

[5] Toads were regarded as especially poisonous animals. Gessner writes: “Diese thier sind gantz schädlich und verletzlich mit jrem gifft: Dann so yemants mit jrem seich berürt | so solches ort faulen: und nit ohn grosse arbeit widerumb heilen. Innerhalb dem leyb ist sy tödtlich. Ir ankucken und gesicht ist schädlich | davon die menschen auch gantz bleych und ungestalt werden sollend.” Considering these properties it is small wonder that the toad was looked upon as so very venomous. Its head was pierced alive, after which it was dried in the shade or burned to ashes.

[6] Megenberg reports: “Aristoteles spricht das des pibers mannes gezeuglein haiz castoreum, das haist ze däutsch pibergail. Das pibergail ist ze vil erznei guot, und waent der piber, man jag in allain der gailn willen, das tier hât die Art, wenne ez der jäger jagt, sô peizt ez im selber sein gailn auz und laezt die liegen, wan es waent | daz man ez nicht jage danne durch der gailn willen.” Valentini refutes this fable. The same author mentions Danzig as the chief source at that time (1704). Adulterations were frequent even then.

Cerebrum hominis,	Human brain.
Cerebrum leporis,	Rabbit's brain.
Chelae cancrorum,	Lobster claws.
Ciconia usta,	Incinerated stork.[7]
Cingulum e corio cervino,	Buckskin straps.
Cingulum e corio humano,	Straps from human skin.[8]
Coagulum leporis,	"Hasenlippe."
Coagulum hoedi,	"Zickleinlippe."
Coccienellae,	Cochineal.
Colla piscium,	Isinglass.
Coluber,	Adder.
Concha fluviata,	River-shell.
“ marina,	Sea-shell.
“ venerea,	Venus-shell.
Corall. alb.,	White corals.
“ nigr.,	Black corals.
“ rubr.,	Red corals.
Cor cervi,	Deer's heart.
“ leporis,	Rabbit's heart.
“ vituli,	Calf's heart.
Cornu alcis,	Elk's-horn.
“ caprae,	Goat's-horn.
“ cervi,	Hart's-horn.
“ hirci,	Buck's-horn.
“ rhinocerotis,	Rhinoceros'-horn.
Cornua scarabaeorum,	Horns of a stag-beetle.
Corvi combusti,	Incinerated crows.
Cranium humanum,	Human cranium.[9]
Cremor lactis,	Cream.
Cuculus ustus,	Incinerated cuckoo.
Dentale,	Purple-fish.
Dens apri,	Wild boar's tooth.
“ fibri,	Beaver's tooth.
“ hippopotami,	Hippopotamus' tooth.
“ hominis,	Human tooth.
“ leporis,	Rabbit's tooth.
Dens lupae et lupi,	Tooth of she- and he-wolf.
“ ursae et ursi,	Tooth of she- and he-bear.
“ trutarum,	Trout teeth.
“ vulpis,	Fox teeth.
Dorsa serpentum,	Spine of snakes.
Ebor,	Ivory.
Entale,	Tooth-shell.
Erinaceus combustus,	Incinerated hedgehog.[10]
Exuviae anguillae,	Eelskin.
Exuviae serpentum,	Snakeskin.
Fel acipitris,	Hawk-gall.
Fel caprae silvestris,	Roe-gall.
“ hirci,	Buck-gall.
“ leporis,	Rabbit-gall.
“ lucii piscis,	Pickerel-gall.
“ perdicis,	Partridge-gall.
“ tauri,	Ox-gall.
“ ursi,	Bear-gall.
Folia operculata cochlearum,	"Blätter von Schneken-Deckeln."
Formicae,	Ants.
Guttur galli exsiccati,	Dried rooster's throat.
“ lupi,	Wolf's throat.
Hepar anguillae,	Eel's liver.
“ cervi,	Deer's liver.
“ lupi,	Wolf's liver.[11]
“ letrae,	Otter's liver.
“ vituli,	Calf's liver.
Hirudines,	Leeches.
Hirudines usti,	Incinerated swallows.[12]
Intestina bovis,	Cattle intestines.
“ cervi,	Deer intestines.
“ lupi,	Wolf intestines.
“ muscellae piscis,	Burbot intestines.
Lac asinae,	Ass's milk.
“ caprinum,	Goat's milk.
“ mulierum,	Woman's milk.
“ vaccae,	Cow's milk.
Lacerta,	Lizards.
Lacrymae cervi sive moschus oculorum,	Musk of a hart.
Lana succida,	Dirty wool.
Lapis carpionum,	Stone from a carp.
“ e bovilo fele,	Stone from the gall of cattle.
“ lyncis,	Stone from a lynx.
“ manati,	"Seekuhstern."
“ percarum,	Stone from a ruff.
“ porcor e ventriculis,	Stone from the stomach of a hog.[13]
“ cancror.,	Crab's eye.
“ trutarum,	Stone from a trout.
“ urogallor, in ventr. eori invent.,	Stone from the stomach of a mountain-cock.
Lepus sicc. et usta,	Dried and incinerated hare.[14]
Lien bovis,	Spleen of cattle.
Limax,	Snails.
Lingua lupi,	Tongue of a wolf.
“ vulpis,	Tongue of a fox.

(To be continued.)

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[7] Lonicer makes the following statement concerning the storks: "Von diesen Vögeln haben wir den Nutzen und Gebrauch der Clystire erlernet. Denn wenn sich die Storchen in dem Leib verstopft befinden | fassen sie den Schnabel voll Meerwasser und spritzen ihnen dasselbige zu den Aftern hinein | oder langen den Unrath mit dem Schnabel zu dem After heraus."

[8] Straps from human or deer's skin were tied around the body to relieve the pangs of child-birth. The straps from deer were obtained in a most cruel manner. Marshal states that according to a report of the Duchess Eleonore, a piece of skin, as broad as a hand and extending from the neck to the tail, was removed from the back of a live deer, after which the animal was given its freedom. This operation had to be performed on a Friday to make the magic effective. On the whole the deer played an important roll in medicine. Valentini mentions the following writings: Dissertatio v. D. J. A. Forck, De Cervo ejusque partibus in medicina usualibus; D. Graba, E aphographia curiosa; and D. Adam (Giessen), Disputat. inauguralis de osse cordis cervi.

[9] Only the skulls of executed persons or of those killed in war were effective. Valentini says that after the last war with the Turks, whole sacks-full of Turk-skulls were sold on the market at Leipsig.

[10] Megenberg writes: "Der Asch der geprant wird von einem igel und gemischt mit zelâzem pech oder harz, ist guot und pringet den masen ir hâr wider auf dem haupt oder an andern enden. Also spricht Plinius." This was then one of the oldest hair-restorers.

[11] Gessner says: "Die Wolfsläber wird mächtig gelobt zu den prästen der läber wird in etliche artzneyen von berümpten artzeten gesetzt."

[12] "Die ausgewachsenen Jungen der Schwalben werden unversehrt in einem bedeckten Tiegel zu Pulver oder zu einer schwarzen Asche verbrannt. Man schreibt dieser Asche eine besondere Wirkung gegen Fallsucht zu, auch wendet man sie bei Bräune und Entzündung der Mandeln, mit Honig vermischt, an." Pharm. Wittenbergica, 1760.

[13] Valentini also mentions a "pedra del porco," the stone from a porcupine. This, a brown stone, the size of a hazel-nut, came from the island Malaia in the East Indies and was very valuable. It was imported by the East India Company, who charged 132—275 Dutch guineas apiece for them. Through middle-men the price became 400—600 guineas. In Holland the stone was rented out at a duckat rental for 24 hrs. It was preserved in a perforated gold capsule, fastened to a gold chain. The author reports miraculous cures.

[14] Hares were very much used. Young ones were burned to ashes alive; with old ones the head and intestines were first removed. The ash was administered in wine, in cases of urinary calculus. The above-mentioned cloths were prepared in a most cruel manner. Hares were caught in the month of May, cut open alive, and the linen cloths dipped into the outflowing blood. After drying, the cloths were used as a cure in erysipelas.

MONTHLY REVIEW.

Pharmaceutical Technique.

A New Bunsen Burner.

Probably no form of apparatus employed by the chemist and pharmacist has been so often modified as the Bunsen burner, but in spite of this some improvements are still being constantly made. Most chemists have probably some time or other felt the want of a burner by means of which heat could be conveniently applied to a vessel from the side, without the extra use of clamps. This is especially the case during distillation, where it is often desirable to have a vessel beneath the flask, so that in case of the accidental breaking of the glass, the contents can be saved.

A burner that seems to lend itself well to this use has recently been patented by R. Dierbach, and can be procured from the firm of Kaehler and Martini, Berlin. The working of the burner can be readily understood from the accompanying figures, which show the apparatus in three different positions.

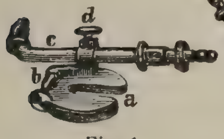


Fig. 1.

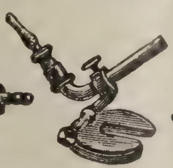


Fig. 2.

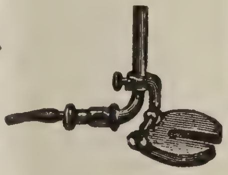


Fig. 3.

The burner consists of a mixing tube bent at right angles, the longer shank capable of being turned, or moved forward and back in the ring *d*. This ring is fastened to an iron plate by means of a hinge, so that by turning the hinge and moving in the ring, the tube can be made to assume almost any position. Besides this, as the portion to which the tubing is attached can be unscrewed and fastened to the other end, the function of the tube can be reversed.

Fig. 3 shows the tube in the ordinary position, in figure 2 it is slanting, while in fig. 3 the tube is placed horizontally.

[Ber. d. deutschen Pharm. Gesells., 1896, p. 76.]

Chemistry.

On the Alkaloids from Cacti.

The alkaloid pellotine isolated from *Anhalonium Wialliamsi* by A. Heffter has recently been more thoroughly examined by the same chemist. He now assigns to this alkaloid the formula $C_{13}H_{19}NO_3$, having made a careful study of its salts and other derivatives.

Anhalonium Lewinii Hennings is another cactus that is used by the Mexican Indians in the preparation of an intoxicating beverage. The dried sliced pieces of this cactus known as muscale buttons seem to constitute an important article of commerce. The word muscale appears to be a corruption of the Spanish Mezcàl = brandy from agaves. Lewin as well as Heffter have made several examinations of this interesting drug. The latter has now examined a larger amount of material obtained through Parke, Davis & Co. He isolated the following substances:

1.) Mezcaline, $C_{11}H_{17}NO_3$.
2.) Anhalonidine, $C_{12}H_{15}NO_3$.
3.) Anhalonine, $C_{12}H_{15}NO_3$.
4.) Lophophorine, $C_{13}H_{17}NO_3$; and prepared a large number of derivatives of each. [Ber. 29, p. 216.]

New Antiseptics.

Basing his experiments on the fact that metallic silver brought in contact with bacterial colonies exerts a germicidal effect on these, without destroying animal tissues, Dr. Credé has employed silver foil, covered with sterile gauze and cotton, as a dressing for aseptic wounds, especially those in which little secretion is expected. Wounds so dressed remained sterile for weeks, and healed more rapidly than when other dressings were used. Dr. Halsted has also made similar observations at the Johns Hopkins Hospital in Baltimore. Instead of silver foil, Credé has recently employed a gauze (manufactured by Max Arnold in Chemnitz, Ger.), to which the metallic silver is so firmly attached that the gauze can be handled and cut like other gauzes. In this form, it should readily find its way into practice, the more so since it can be kept indefinitely. Powdered silver, fastened to mull, furnishes another dressing, intended to replace iodoform gauze in the treatment of deep wounds. After having lain in wounds for 8 days, it was found to have retained its germicidal properties.

Under the name of Actol, the firm of Dr. Heyden, in Radebeul, (Ger.), puts on the market the lactate of silver, which according to Dr. Credé has valuable antiseptic properties. In solutions of 1:1000 it kills bacteria in 5 minutes, and in dilutions as great as 1:50,000 it retards their growth materially. The preparation is soluble in fifteen parts of water, is not caustic, and can be used either in powder or subcutaneously, in the latter case in doses not to exceed 0.1 g. As a gargle, a teaspoonful of a 2% solution of the salt in a glass of water may be employed.

Itrol, the name given to a preparation also manufactured by the above named firm, is the citrate of silver, and is intended to replace actol as a dusting powder, since it is less liable to form lumps than the latter. Since itrol is difficultly soluble (1:3800) its antiseptic powers are very lasting, and as it is not irritating in the least, it can be employed for all wounds. The powder is dusted directly upon the wounds, or made into a salve (1:50—100) with lard, vaseline or lanolin. An aqueous solution (1.4—5000) can be used for disinfecting hands, instruments, etc., while a solution of 1:5—10,000 furnishes an excellent gargle.

[Zeitsch. d. allg. österr. Apoth. Vereins, 1896, p. 276.]

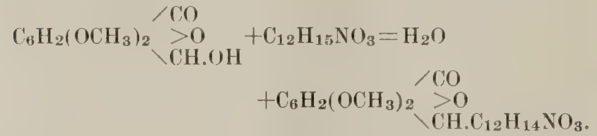
Fermentation of Cellulose.

Bacillus amylobacter, which has hitherto been regarded as the special ferment of cellulose, is really a collective species, including a large number of different butyric ferments. None of these has, says V. Omelianski, so far shown any marked power of decomposing pure cellulose. The special microbe of cellulose fermentation can be isolated by the method of elective cultures. Swedish filter paper and chalk are placed in a solution of potassium phosphate, magnesium sulphate, and ammonium sulphate, with a trace of ooze of the Néva. The flasks are hermetically closed and kept at 30—35°; fermentation is somewhat rapid, and the paper becomes yellowish, transparent, and gelatinous, and finally dissolves, some of the chalk dissolving at the same time. The ferment is found on the paper and not in the liquid; it is very thin, 6 to 7 μ long, and 0.2—0.3 μ broad, and forms very round spores, 1 μ in diameter. Further cultivations on potato are necessary, in order to obtain the bacillus quite pure.

[J. C. S., 70, p. 202; from Compt. rend., 121, p. 653.]

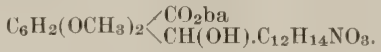
Synthesis of an Isomer of Narcotine.

While trying to obtain narcotine by condensation of opianic acid and hydrocotarnine Liebermann prepared an isomer of this opium alkaloid according to the following reaction:



$$C_6H_2(OCH_3)_2\begin{array}{l}/CO\\ >O\\ \backslash CH.OH\end{array} + C_{12}H_{15}NO_3 = H_2O + C_6H_2(OCH_3)_2\begin{array}{l}/CO\\ >O\\ \backslash CH.C_{12}H_{14}NO_3.\end{array}$$

Isocotarnine crystallizes from alcohol in prisms or needles. It is soluble in boiling benzene and is precipitated from the benzene solution by petroleum ether. The alcoholic solution is strongly alkaline. It melts at 194° without decomposition. Insoluble in ammonia, alkalies and alkali carbonates. Baryta water dissolves it upon prolonged boiling, forming barium isonarcotinate,



$$C_6H_2(OCH_3)_2\begin{array}{l}/CO_2ba\\ \backslash CH(OH).C_{12}H_{14}NO_3.\end{array}$$

After the barium has been precipitated as sulphate, soda solution precipitates regenerated isonarcotine. Isonarcotine is readily soluble in sulphuric and hydrochloric acids. The salts with hydrobromic and hydriodic acids are less soluble. The hydriodate is almost insoluble in cold water. The nitrate is also sparingly soluble.

Isonarcotine is not identical with gnoscopine, another isomer of narcotine isolated from opium by H. Smith. Isonarcotine can readily be distinguished from narcotine by the carmine color produced with concentrated sulphuric acid. Hydrocotarnine can be identified in the same way when opianic acid is previously added, or opianic acid, by first mixing it with hydrocotarnine. The same is true of cotarnine after it has been reduced to the hydrocompound with zinc and hydrochloric acid. [Ber. 29, p. 183.]

Ethyl Alcohol from the Fermentation of Asphodelus ramosus and Scilla maritima.

The tuberous roots of *Asphodelus ramosus*, which grows abundantly in the wild state in Algeria, were cut up and extracted with warm water by diffusion by G. Rivière and Bailhache. The solution was boiled, allowed to cool, mixed with 2 percent of lime, allowed to remain for 48 hours, filtered, and the excess of calcium precipitated with sulphuric acid; after removal of the calcium sulphate, the "solution" was limpid, and slightly amber colored. The exhausted cossettes were pulped, mixed with 2 percent of sulphuric acid, boiled in order to completely saccharify the starches, filtered, mixed with lime in quantity sufficient to leave an excess of 2 percent, and allowed to remain 48 hours. It was then filtered, neutralized with sulphuric acid, and, after separation of the calcium sulphate, mixed with the solution obtained in the first stage.

The mixed solutions were sterilized by successive ebullitions with two days interval, cooled, and mixed with pure yeast from the white wine of Burgundy. Fermentation begins almost immediately, and is complete in four or five days, distillation yielding a liquid with an alcoholic strength of 50° to 55°. The alcohol has the agreeable bouquet due to the yeast, and is free from the disagreeable odor that has hitherto characterised alcohol from the asphodel.

Scilla maritima, which also grows abundantly in the wild state in Algeria, when treated in a similar manner, yields an alcohol resembling wine brandy, and with the bouquet characteristic of the particular yeast.

The alcohol from *Scilla* has a flavor somewhat inferior to that of the alcohol from *Asphodelus*, and contains a higher proportion of aldehyde. Both, however, are free from furfuraldehyde, and contain only slight traces of higher alcohols.

[J. C. S., 70, p. 203; from Compt. rend., 121, p. 659.]

Solubility of Silver Halogen Salts in various Solvents.

The experiments of Valenta on the solubility of the silver salts of halogen acids in sodium thiosulphate and in potassium cyanide, indicate that the solubility is not that deducible from the equations (I) $3Na_2S_2O_3 + 2AgCl = (AgS_2O_3Na)_2, Na_2S_2O_3 + 2NaCl$ and (II) $2KCN + AgCl = KAg(CN)_2 + KCl$. Ernst Cohen has, therefore, examined these solubility phenomena with the following results. (1) Silver chloride, if not in excess, dissolves in sodium thiosulphate in accordance with equation I. (2) If the silver chloride is in excess, the less soluble salt $(AgS_2O_3Na)_2$ is formed. (3) If not in excess, silver chloride dissolves in potassium cyanide solution in accordance with equation II. (4) Excess of the silver salt causes the double salt to be partly decomposed, with formation of silver cyanide and potassium which can react in the reverse sense until equilibrium is reached, $KAg(CN)_2 + AgCl \rightleftarrows 2AgCN + KCl$. Valenta's results were due to the fact that he operated with a large excess of silver haloïd.

[Zeit. physikal. Chem. (1895), 18, p. 61.)

Botany and Pharmacognosy.

Opuntia vulgaris Mill.

Miss Bertha L. De Graffe in an article on the prickly pear, one of our widely distributed cacti characteristic of many sandy and rocky localities, gives the results of a study of the constituents of the plant, particularly of the fruit. A large percentage of sugars, albuminoids and mucilage was found; alkaloids, glucoscides and tannin were not present. This composition makes it easily understood why this fruit is a favorite article of diet among the Indians, who use it when fresh and dry it for winter use. The fresh, unripe fruit, after being boiled with water for ten or twelve hours, is allowed to ferment and furnishes a substance alike stimulating and nutritious.

[Am. Journ. Pharm., 68 (1896), p. 169.]

Action of Poisons on Plants.

F. W. Cord finds that water solutions of the irritant poisons, arsenic, corrosive sublimate, mineral acids, etc., are fatal to plants in a short time in very great dilutions. The neurotic poisons, strychnine, aconite, etc., were not fatal in the strongest doses used, 1/10 of one percent. Alcohol in a very strong solution was fatal.

It is interesting to note that a degree of concentration harmless when the neurotic poisons were used proved fatal with the irritant poisons. The reverse quantitative relation holds for animals.

[Am. Journ. of Pharm., 68, p. 218; from Garden and Forest.]

Formation of Indigo in Plants of the Order Indigofera.

According to van Lookeren and van der Been the extract of the leaves of the *Indigofera* shows an alkaline reaction with litmus and with rosolic acid, an acid reaction with phenolphtaleïn. When the leaves are "fermented" with dilute (0.5 to 1 percent) acids, solutions are obtained which yield indigo under the influence of atmospheric oxygen and behave similarly to the solutions obtained by reducing ordinary indigo, precipitating with dilute acid, extracting with chloroform, and taking up the residue with water. Such a solution cannot be obtained from pure indigotin.

Indigotin-white, together with indirubin-white, and other products formed from indican under the influence of enzymes in absence of air, behave differently, as regards solubility in water and chloroform and in the readiness with which they are oxidized, from indigo-white, either in pure state or mixed with indifferent substances. Indigo-blue containing so called indigo-brown is slightly soluble in presence of free alkali, whilst if indigo-red is present it is also soluble in alcohol; this explains why acid extracts contain indigo-white in solution.

[J. C. S., 70, p. 207; from Landw. Versuchs-Stat., 46, p. 249.]

The Location of the Active Principle of Rhamnus Purshiana D. C.

M. Eug. Cabannes discusses briefly the history of our knowledge of the active principles of *Rhamnus frangula* L. and of *R. Purshiana* D. C. and by use of the reaction of Borscow seeks to locate the active principles in the tissues.

When sections of *Rhamnus frangula* are placed in an alcoholic solution of potash, the cells containing frangulin quickly take on a cherry-red color. The cortical parenchyma, the bast and especially the medullary rays respond to the test.

Transverse sections of the bark of *R. Purshiana* when similarly treated show the coloration in the five or six layers of the bast most nearly adjacent to the cambium, in the medullary rays and in one or two layers of the cortical parenchyma.

Ammonia and the alkalis in general produce the same color reaction as the potash reagent.

[Repert. d. Pharmacie, 1896, p. 97.]

Ainu Medicinal Plants.

In the first part of an article on the medicinal plants of the Ainus, the inhabitants of the Kurile Islands, a group lying to the north of Japan, Rev. John Batchelor and Dr. K. Miyabe mention some interesting species and remedies.

The bitter roots of the Arikko (*Thalictrum aquilegifolium* L.) either raw or roasted are used for pains in the stomach. A strong decoction is sometimes used instead. The chewed root is bound to wounded parts to prevent suppuration. The bruised leaves are applied to bruises or contusions and to parts of the body suffering from internal pain. The bitter, dried root of Horap or Orap (*Peonia obovata* Maxim) when swallowed with water gives immediate relief from stomach-ache. When chewed to a paste, it is applied to aching joints. The seeds are chewed up and the expressed juice dropped into the eye as a remedy for sore eyes. Pains in the ears are eased by blowing the smoke from a mixture of tobacco and powdered seed into them.

Otompni-kina (*Chelidonium majus* L.) is used in a variety of ways. The stems and leaves softened by dipping into hot water are applied to painful bruises and contusions. It is believed to be an antidote for snake poisoning and the yellow juice is supposed to destroy warts.

Shikerebe-ni (*Phellodendron amurense* Rupr.) has a bitter, yellow inner bark which when bruised or dampened is bound to bruises and similar injuries to relieve pain. The berries are said to be a good expectorant as well as an article of food.

The poisonous root of Tokaomap (*Cicuta virosa* L.) when charred is used for external application for pains in the bones.

[Pharm. Journ., 1896, p. 147.]

Colchicum autumnale, L.

In a recent number of Die Natur, is a pleasing article by Dr. Karl Mueller on this interesting little plant. In the late summer and the autumn, from August to October, after most flowers have already gone, there appears the pale, flesh-colored flower (and the flower only) of the Colchicum. The early botanists were not a little puzzled to account for this leafless condition. It was, however, later seen that two years are necessary for this plant to complete its cycle of development. The first year produces from the underground corm, the flower, which is followed next year by the fruit and the foliage.

It is an interesting fact that during the year of flowering, not only in the corm-like underground structure but also in the other parts an extremely poisonous alkaloid is produced, namely colchicine, which combines with a bitter substance, colchiceine, and a sharp, volatile body, a fatty acid. These substances occur most abundantly in the rhizome at the time of flowering, whereas, during the fruiting year the starch may be eaten without harm. Because of these contents, the *Colchicæ* ally themselves, together with the group of the *Veratreæ*, to the monocotyledonous family *Melantheæ*.

The beautiful flower itself consists of a long, funnel-formed tube which runs out into six tongue-shaped divisions. It is composed of firm, flesh-colored tissues and has almost the smooth finish of porcelain, giving to the flower an aspect decidedly peculiar. Hence, perhaps, the popular name in some parts of Germany, *nackte Jungfer*, naked maiden. In the throat of the tube are the delicate stamens, with movable anthers and the styles hiding the future fruit. This consists of a rather large, compound capsule containing many round seeds.

Colchicum is used medicinally for rheumatism, gout and dropsy. [Die Natur, 44, p. 550.]

Practical Pharmacy.

Alkaloid-Stearates and their Therapeutic Applications.

Physicians not infrequently prescribe mixtures of alkaloids with fats and oils, for ointments or in suppositories. Undoubtedly these mixtures would be more effective, if the alkaloids were soluble in the fats and oils, which is not the case with the ordinary alkaloidal combinations. To remedy this defect, Francesco Zanardi has prepared the stearates of the alkaloids mostly used in this way; viz., those of morphine, atropine, and cocaine. The stearates are all soluble in fats and in petrolatum. Their properties and methods of preparation are given in the following:

Morphine stearate ($C_{17}H_{19}NO_3 . C_{17}H_{35}COOH$). Prepared by direct union of the components, or by double decomposition. According to the first method, equimolecular quantities of stearic acid (5.68) and morphine are allowed to react upon one another. The stearic acid is dissolved in a flask in 100 ccs. of absolute alcohol, by means of a gentle heat, and the morphine added in small quantities at a time. The warm solution is filtered, when upon cooling the morphine stearate crystallizes out. By concentration of the mother liquors, further yields can be obtained. The crystals are dried between 30° and 40° C.

A completely neutral stearate can be obtained by decomposing morphine hydrochlorate with sodium stearate.

The sodium stearate is prepared by adding to a warmed mixture of 5.68 g. finely cut stearic acid in 50 g. distilled water, 20 ccs. (= 0.8 g. NaOH) normal sodium hydroxide solution. To the resulting solution, 7.51 g. of morphine hydrochlorate, dissolved in 100 g. distilled water, is added. Upon mixing, the morphine stearate separates out as a bulky, white precipitate; this is collected on a filter and washed with water until the washings are no longer rendered turbid by hydrochloric acid, or by silver nitrate test solution after acidulating with a few drops of nitric acid. The stearate so purified is dried and re-crystallized from alcohol.

Morphine stearate forms white, shining, crystalline scales, unctuous to the touch and melting at 84—86°. At 100° decomposition sets in and at 150° the mass is blackened. In water, morphine stearate is practically insoluble; in cold alcohol it is only slightly soluble; in warm alcohol readily soluble. Ether dissolves but a small quantity; petroleum-ether, benzene, chloroform, and oil of turpentine, still less. In fixed oils it is soluble to about 1% at ordinary temperatures; fats and vaselin also dissolve it.

Stearic acid is tested for in this stearate by the addition of copper sulphate to the finely-divided substance suspended in water; the presence of morphine is proved by nitric acid and the other usual reagents.

By means of this stearate, containing 50.17% of morphine, we can prepare morphine "oil", morphine salves and morphine suppositories.

Atropine stearate ($C_{17}H_{23}NO_3 . C_{17}C_{35}COOH$). Prepared according to the same methods employed for the corresponding morphine salt.

It crystallizes in fine, white, shining needles, unctuous to the touch, melting at 120°, and decomposing at 170°.

The solubility of atropine stearate in various solvents does not differ materially from that of morphine stearate. Its atropine content is 50.43%.

The presence of stearic acid is proved as before with copper sulphate; the atropine is separated from the stearate by means of tartaric acid and tested for in the usual manner.

The solution of atropine stearate in oil of sweet almonds (0.1 : 50.0) furnishes an efficient substitute for hyoscyamus "oil" (D. A. III) and belladonna "oil". The stearate is dissolved in the oil, using a gentle heat. In place of extract of belladonna in suppositories and ointments, atropine stearate can find a rational employment.

Cocaine stearate ($C_{17}H_{21}NO_4C_{17}H_{35}COOH$). This substance is also prepared according to the above-mentioned methods. For 2.84 g. of stearic acid, 3.03 g. of cocaine are used.

Cocaine stearate crystallizes in white, shining needles, united in the form of bundles; melting-point about 90° C. It contains 51.63% cocaine. Solubility about the same as the above.

The tests for stearic acid are same as for the morphine salt; cocaine is identified by the usual reactions, after separation with tartaric acid.

[Apoth. Zeit., 1896, p. 141; from Bollettino chimico farmaceutico, 1896, 4.]

Tests for Sozoiodol-salts.

A. General Tests:

1. Upon heating sozoiodol-salts alone or with concentrated sulphuric acid, iodine is liberated; in the latter case, iodophenol with its characteristic odor is also formed. Bromine-water separates iodine from solutions of sozoiodol salts.

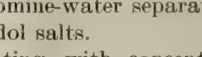
2. Upon heating with concentrated nitric acid, iodine is liberated, after the complete volatilization of which, yellow scales of picric acid separate out.

3. The aqueous solutions of sozoiodol-salts with a few drops of ferric chloride solution, yield an intense bluish-violet color changing to a reddish-violet, and upon heating with potassium chlorate and hydrochloric acid form chloranil (tetrachlorquinone), which separates in golden-yellow shining scales and can be recognized, even in very dilute solutions, by its characteristic and intense odor.

B. Special Tests:

1. Sozoiodolic acid comes on the market in small, prismatic, acicular crystals, readily soluble in water, alcohol, and glycerin. The tests for impurities are the same as those of the potassium salt.

2. Sozoiodolate of mercury appears on the market as a deep citron-yellow powder of extreme fineness, and with a constant mercury content of 32 percent, corresponding to the formula



$$C_6H_2I_2\left\langle\begin{matrix}O \\ SO_3\end{matrix}\right\rangle Hg.$$

Upon heating, the salt swells and rapidly volatilizes without leaving a residue. In water and alcohol it is practically insoluble. 0.5 g. of the salt however dissolve in 30 ccs. of a 5 percent solution of common salt; the freshly prepared solution should have no white or yellowish-white precipitate in suspension, nor show more than a slight turbidity. If 0.1 g. of the salt is dissolved with the aid of heat in 9 ccs. of water to which 1 cc. of nitric acid has been added, not more than a faint cloudiness should result after treating with a few drops of silver nitrate test-solution (chlorine). 0.2 g. of the salt are soluble in 20 ccs. of water acidulated with a few drops of hydrochloric acid. 10 ccs. of this solution should not be rendered cloudy by barium chloride test-solution (not more than 2–3 drops should be used), nor by dilute sulphuric acid (absence of sulphates and barium salts resp).

With ammonia, a solution of the salt in salt solution yields a yellowish or grayish white, with hydrogen sulphide, a black precipitate.

The quantitative determination of the mercury is accomplished by dissolving 2 g. of the preparation in salt solution, adding 1–2 drops of hydrochloric acid and precipitating with hydrogen sulphide. The resulting mercuric sulphide is collected on a tared filter, dried at 100° and weighed.

3. Potassium sozoiodolate is found on the market as a white, light powder, which swells very much upon heating on platinum-foil (resembling the so-called Pharoah's serpents); at the same time, the disagreeable odor of iodophenol appears.

It is insoluble in alcohol. 0.5 gms. of the finely powdered salt dissolve upon shaking with 50 ccs. of water at 15°.

Upon treating 20 ccs. of this solution with two drops of silver nitrate t. s., a white precipitate results immediately, which should be completely soluble in dilute nitric acid (concentrated acid is liable to liberate iodine). Not more than a faint opalescence should remain (traces of chlorine); a yellowish turbidity shows the presence of traces of free iodine in the preparation.

If a few drops of barium chloride solution (1:20) are added to 10 ccs. of the above solution, the resulting white precipitate (barium sozoiodolate) should dissolve completely upon warming, or upon the addition of ammonia (absence of sulphates). A few drops of dilute sulphuric acid added to 10 ccs. of the same solution should produce no turbidity (barium). Ammonium sulphide as well as hydrogen sulphide solution should produce no change in a solution of 0.5 gms. of the salt in 50 ccs. of water. Bromine water shaken with an aqueous solution (0.5 g. in 50 ccs.) of the salt should cause no turbidity (a cloudiness would indicate potassium phenolate as tribromphenol).

4. Sodium sozoiodolate appears in beautiful, white, prismatic needles, of an astringent taste at first, then sweetish. 1.0 g. is readily soluble in 20 ccs. of cold water, more soluble in warm water. In warm glycerin the solubility is about the same. In warm, especially in dilute alcohol (80 percent), it is soluble to about 50 percent. Upon heating it does not swell. The tests given for the potassium salt to prove absence of chlorides, sulphates, barium etc., also apply here.

5. Zinc sozoiodolate crystallizes in fine colorless needles, which do not swell upon heating. More soluble in alcohol than in water. The finely powdered salt is soluble in 50 p. of cold and in 20 p. of warm water, remaining in solution in the latter case upon cooling. 1 g. of this salt dissolves in 10 g. of alcohol at ordinary temperatures. The tests for purity are identical with those for the potassium salt, except that, of course, hydrogen sulphide and ammonium sulphide yield white precipitates.

6. The tests for the other sozoiodol-salts, viz: those of aluminum, ammonium, silver, lithium, magnesium, lead etc., are, in the main, the same as those before mentioned. [Trommsdorff's Laboratory.]

Physiology, Pharmacology and Therapy.

Poisonous Effects of Acetylene.

According to **Nestor Gréhant** a mixture of 20 vols. of acetylene, prepared from calcium carbide, 20.8 vols. of oxygen, and 59.2 vols. of nitrogen was breathed by a dog for 35 minutes without any marked disturbance, and 100 cc. of the blood was found to contain 10 cc. of acetylene. With 40 vols. of acetylene, the proportion of oxygen remaining the same, a dog died in less than an hour, owing to the failure of the heart's action, and 100 cc. of blood contained 20 cc. of acetylene. With 79 vols. of acetylene and 21 vols. of oxygen, the poisonous effects were still more strongly marked. It follows that acetylene may be fatally poisonous when present in proportions as high as 40 percent by volume.

A mixture of coal gas with air and oxygen containing 20.8 percent of the latter and 1 percent of carbonic oxide was nearly fatal to a dog after it had been breathed for about 10 minutes, and 100 cc. of the dog's blood contained 27 cc. of carbonic oxide. It follows that acetylene is much less poisonous than ordinary coal gas.

Berthelot, in some experiments made many years ago, in conjunction with **Claude Bernard**, found that acetylene, when present to the extent of a few percent by volume, is without injurious effects on birds. The poisonous properties often attributed to this gas, as prepared by the older methods, are probably due to the presence of carbonic oxide or hydrogen cyanide.

Moissan finds that when acetylene is prepared from pure calcium carbide, and is purified by being liquified, it has a very ethereal odor, and can be breathed in small quantity without evil effects. If, however, the calcium carbide has been prepared from coal and impure lime, it may contain calcium sulphide and phosphide, and the acetylene prepared from it then has a very disagreeable odor.

[J. C. S., 70, p. 200; from Compt. rend., 121, p. 564; ibid., p. 566.]

Derivatives of Hydrastine and Narcotine.

According to **Edmund Falk**, methylhydrastamide produces, in both cold- and warm-blooded animals, peripheral paralysis. In large doses, it paralyses the heart; it dilates the vessels, lowers the blood pressure, and causes death by cessation of respiration.

Methylhydrastimide acts on the muscular tissues producing paralysis preceded by cramps; even in small doses it weakens the heart. There is dilation of the vessels, and death occurs, as in the former case.

Methylnarcotamide produces a narcotic state by acting on the cerebrum, and there is paralysis of a peripheral nature. Very large doses are necessary to affect the heart; there is a fall of blood pressure. Respiration is first quickened, then becomes slower, and finally ceases.

Methylnarcotimide is a narcotic, but paralysis is incomplete and accompanied by a stage of muscular cramp; on the heart, however, its paralysing action is more marked. It is a local anaesthetic at the seat of application. There is a fall of blood pressure. Respiration rises during the convulsions, but in the narcotic stage falls, and finally ceases.

[J. C. S., 70, p. 201; from Virchow's Archiv, 142, p. 360.]

In Memoriam.

Prof. Jean Mueller.

Professor Mueller, formerly professor of botany at the University of Geneva, and known as Mueller Argoviensis (from the canton Aargau, his former home) in distinction from other botanists of the same name, died recently in Geneva, Switzerland. His principal work is a monograph on the family *Resedaceae*. For Martius' Flora Brasiliensis he wrote the chapters on *Apocynaceae*, *Euphorbiaceae* and *Rubiaceae*, and for Decandolle's Prodromus the chapter on *Resedaceae*. Besides the university professorship Mueller occupied the position of curator of the city herbarium and of director of the botanical garden.

Dr. Chas. O. Curtman.

The sad news of the death of Dr. Chas. O. Curtman of St. Louis has just been received. Dr. Curtman was well known in medical circles as Professor of Chemistry at the Missouri Medical College. To pharmaceutical readers he is familiar as a writer on analytical chemistry. Back volumes of the Pharmaceutical Review contain many articles on analytical subjects from his pen. It may be less generally known that he was one of the most active members of the Committee of Revision of the last U. S. Pharmacopœia, being chairman of the committee on inorganic chemicals.

His recent illness was known to some of his friends, but the news of his death on the 22nd of last month was a sad surprise to all who had in mind his robust form and constitution.

Literary.

Books and Pamphlets Received.

Wilhelm Braumüller—Wien. Handwörterbuch der Pharmacie. Pracktisches Handbuch für Apotheker, Aerzte, Medicinalbeamte und Drogisten. Herausgegeben von A. Brestowski. Zwei Bände. 242 (Schluss-) Lieferung. 1895. M. 2.40.

Bibliographisches Institut — Leipzig. Meyers Konversations-Lexikon. 5. Aufl., Bd. 11. Langenbeck bis Mauri. 1076 Seiten mit zahlreichen Illustrationen. 1896.

A. Hartleben's Verlag — Die Cyan-Verbindungen. Ein Handbuch für Fabrikanten, Chemiker, Aerzte, Apotheker, Drogisten, Galvaniseure, Photographen, etc. Nach den neuesten Erfahrungen bearbeitet von Dr. Friedrich Feuerbach, technischer Chemiker. Ein Bd., pp. XVI, 400, mit 25 Abbildungen.

Herman Heyfelder — Berlin. Chemisch-technisches Repertorium. Uebersichtlicher Bericht über die neuesten Erfindungen, Fortschritte und Verbesserungen auf dem Gebiete der technischen und industriellen Chemie. Herausgegeben von Dr. Emil Jacobsen. 34. Jahrgang. Zweites Halbjahr. Erste Hälfte. Mit in den Text gedruckten Illustrationen. 1895.

Ginn & Company — Boston. Chemical Experiments, General and Analytical. For use with any text-book of chemistry, or without a text-book. By R. P. Williams, Instructor in Chemistry, English High School, Boston. One Vol., pp. XIII, 102, with tables and illustrations.

Chr. Herm. Tauchnitz — Leipzig. Anatomischer Atlas der Pharmacognosie und Nahrungsmittelkunde. Von Dr. A. Tschirch und Dr. O. Oesterle. Lief. 10. 1896. M. 1.50.

Field Columbian Museum — Chicago. Flora of West Virginia. By Charles Fr. Millspaugh and S. W. Nuttall. Botanical Series, Vol. I, No. 2, pp. 69—276, with three plates.

Am. Pharm. Assn. — The National Formulary of Unofficial Preparations. Revised Edition. By authority of the American Pharmaceutical Association. One Vol., pp. XIII, 104. Cloth. 1896.

Lea Brothers & Co.—Philadelphia. The National Formulary. New and revised edition. Supplement to the National Dispensatory. Brochure, pp. VIII, 115. 1896.

Pharm. Review Publ. Co. — Milwaukee. Popular German Names of Domestic Drugs and Medicines. Compiled by Dr. Fr. Hoffmann. Revised and enlarged edition of 1892. Pamphlet, pp. 36. 1896. $0.50.

Schimmel & Co. — Leipzig. Bericht, April 1896. Brochure, pp. 87, with a map.

Maryland State Pharmaceutical Association — Baltimore. Thirteenth Annual Proceedings. Baltimore, May 7 and 8, 1895. Including President's Address, Reports of Committees and Papers read, also List of Officers and Members, Constitution and By-Laws, Pharmacy Law for Baltimore, etc. Brochure, pp. 58, with one photogravure plate.

Authors — Leipzig. Ueber Geraniol und Rhodinol. Von J. Bertram und E. Gildemeister. Pamphlet, pp. 13.

University of Wisconsin — Madison. Agricultural Experiment Station.* Bulletin No. 49. The Maintenance of Soil Fertility: Commercial Fertilizers. By F. W. Woll.

—— Bulletin No. 50. The Hot Water Treatment for the Prevention of Smut on Oats, Wheat and Barley. By E. S. Goff.

Vanderbilt University — Nashville, Tenn. Announcement of the Department of Pharmacy, 1896—97. Pamphlet, pp. 27.

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* The Bulletins and Annual Reports of this Station are sent free to all residents of Wisconsin upon request.

Robert Clarke Company—Cincinnati. Etidorhpa; or The End of Earth; the strange history of a mysterious being, and an account of a remarkable journey; as communicated in manuscript to Llewellyn Drury, who promised to print the same, but finally evaded the responsibility, which was assumed by John Uri Lloyd; with many illustrations by J. Augustus Knapp. Fourth edition. 1896. $2.00.

Central Tennessee College — Nashville, Tenn. Catalogue of 1895—96 and Announcement for 1896—97 of the Meharry Medical, Dental, and Pharmaceutical Departments. Pamphlet, pp. 24.

Zweiundvierzigster Jahresbericht des germanischen Nationalmuseums. 1895.

E. Merck — Darmstadt. Bericht über das Jahr 1895. Herausgegeben im Januar 1896. No. 126.

—— Annual Report on the Year 1895. Published in March 1896. No. 128.

Dr. Peters and Rost — Berlin. Preisliste über Apparate und Utensilien für Chemie, Electrochemie, Pharmacie, Bacteriologie, Hygiene, Mikroskopie, Berg- und Hüttenwesen, Physik, etc. Ein Bd., pp. 480, mit zahlreichen Illustrationen. 1896. M. 3.00.

Parke, Davis & Co. — Detroit. Price List, 1896. Brochure, pp. 268.

Reviews.

Etidorhpa; or The End of Earth; the strange history of a mysterious being, and the account of a remarkable journey; as communicated in manuscript to Llewellyn Drury, who promised to print the same, but finally evaded the responsibility, which was assumed by John Uri Lloyd; with many illustrations by J. Augustus Knapp. The Robert Clarke Company, Cincinnati. 1896.

Since the appearance of the author's limited edition of Etidorhpa barely five months ago the demand for the work has been so great that a second and a third edition have been exhausted as soon as prepared, and a fourth is now before us.

In a review of the first edition* it was said: "The work is suggestive, not didactic. . . . . The nature and direction of the thoughts that it arouses will be determined by individual tendencies." The truth of this assertion has been shown by the diversity of the published comments on the book. As a rule, specialists in science have been most impressed by hints in the direction of their individual lines of work; those of a philosophical turn of mind have found the metaphysical speculations of great interest; and theologians and moralists see promise of future possibilities in religious thought and bestow high praise on the temperance lecture, Chapters 36—39.

The present time is particularly opportune for a book of this kind. Not only are all departments of science at least normally alert and active, but the discovery of argon and of the action of the X-rays have awakened popular interest in the possibility of other equally wonderful revelations. In view of the fitness of the time and the excellence of the work it would not be strange if the success that Etidorhpa has so far achieved were but the beginning of what is to follow.

It is extremely fortunate that the work which seems more than any other to gratify the desire for a stimulus in scientific speculation is not based wholly on narrow materialistic and commercial ideas. Although the material importance of advance in science receives due attention, as in the chapter on the Food of Man, there is none of the spirit that coupled with the first announcement of Prof. Roentgen's discovery the statement that it furnished a means of identifying paste diamonds and of detecting flaws in armor plate. While the basis of the book is wholly scientific and there is an entire absence of gush and sentimentalism, the point of view is that of one who looks toward higher, not toward lower things. Many of the conceptions, though approached from the scientific side and expressed in a scientist's way, are in essence intensely poetic. The book may do something toward correcting the impression that to have the scientific spirit is to think on what one shall eat and drink, and wherewithal one shall be clothed, and perhaps to speculate a little on the dullest and least profitable metaphysical questions.

While considering the book as a general stimulus to thought, the reader must not forget that the separate parts express the results of careful speculation in various lines of science. Though the author obviously does not accept the exact theories put forward, except so far as they are at present capable of proof, he does indicate his belief that research along the lines of study discussed will yield startling results; and some of his strange statements may perhaps be considered as conjectures of what future discoveries may be. As years go by the possessor of a copy of Etidorhpa will take pleasure in seeing how far these hinted prophesies are fulfilled.

The fourth edition is from the same plates as the first, and paper, presswork and binding are very good. Those who have seen earlier copies will regret that the exquisite picture of Etidorhpa has been replaced by a much more common-place conception; though the latter is well-executed. A new portrait of I-Am-The-Man appears as frontispiece. The special preface to the author's edition and extracts from many reviews are found at the end of this volume. Students of pharmacy, chemistry and related subjects may be interested to know that Prof. Lloyd has dedicated the proceeds from the sale of commercial editions of Etidorhpa to the enlargement of his famous library.

William B. Cairns.

The Year-Book of Treatment for 1896. A critical review for practitioners of medicine and surgery. Published by Lea Brothers & Co., Philadelphia. One vol., 12 mo., pp. 484. 1896. $1.50.

A dozen times the Year Book of Treatment has appeared before its American admirers, reflecting the progress of British Medical thought. Those who have walked the hospitals of London find the views of their old teachers expressed on all practical subjects. Suffice it to enumerate a few of the themes that have been carefully reviewed. The Nauheim method of treating chronic heart affections is called attention to at length. Every practitioner in this country ought to read that article, as our literature is scanty. The article on thymus feeding in Graves disease, on nucleins in pulmonary troubles, on the Flechsig method of treating epilepsy, on tetano-antitoxin, on the gouty heart, on diphtero-antitoxin, on massage and early mobilization in the treatment of fractures, and the ambulant treatment of fractures of the lower extremities, on the surgery of the gall-bladder, on surgical treatment of idiocy, on castration in the treatment of hypertrophy of the prostate, and many more, suffice to show the progressive tendency of the Year Book. The subject of the supervision of tubercular patients by the local board of health, gives food for reflection for all health-officers. Stringent laws ought to be enacted to control this great scourge. Every active practitioner will welcome the Year Book, and the druggist will find a careful estimate of the therapeutic value of all the newer drugs.

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* Pharmaceutical Review, 14, p. 24.

F. R. Weber.

Meyer's Conversations-Lexicon. Ein Nachschlagewerk des allgemeinen Wissens. 5te, gänzlich umgearbeitete Auflage. 11ter Band. 1076 Seiten. Langenbeck bis Mauri. Bibliographisches Institut, Leipzig und Wein. 1896.

Das in früheren Besprechungen über dieses wohlbekannte Werk gesagte gilt auch für den 11ten Band. Derselbe enthält unter anderen grösseren Artikeln solche über Lebensversicherungswesen, Leder, Lehrfreiheit, Lehrlingswesen, Leibniz, Leipzig und die Leipziger Neubauten, Lessing, Leuchtgas, Leuchthürme, Licht, Linné, Linoleum, Linse, Lithographie, Locomobile, Locomotive, London, Louisiana, Lübeck, Luft, Luftpumpen, Luther, Madagaskar, Madras, Madrid, Magdeburg, Magen und Magenkrankheiten, Magnetismus, Mähren, Mailand, Malaiischen Archipel, Malerei, Marine, Markthallen, Maschinen, Maasse, Mathematik. An Chromobildern enthält der Band nur zwei, dagegen eine beträchtliche Zahl trefflich ausgeführter Städtepläne in Farbendruck. *Fr. H.*

Die Vegetation der Erde. Sammlung Pflanzen-geographischer Monographien. Herausgegeben von A. Engler und O. Drude. Bd. 1: Grundzüge der Pflanzenverbreitung auf der iberischen Halbinsel. Von Prof. Dr. Moritz Willkomm. Ein gr. Octavband. Mit 2 Karten, 2 Heliogravueren und 21 Textabbildungen. 1896. M. 12.00

Prof. Griesebach's well-known sketches "The vegetation of the earth" have been a standard work for more than one generation; but since the time when this excellent treatise was written the knowledge of the plants of the earth and of their geographical distribution and botanical relation has been much extended on the one hand and specialized on the other. Many accomplished botanists in the various countries have assiduously compiled and published special monographic "floras" of whole countries or of certain parts of countries, or of certain large groups or families of the higher or the lower plants. But few have endeavored to treat the vegetation of large areas and whole countries from a more commanding point of view so as to bring the separate sketches with a broader grasp into a general, uniform aspect. Two of the foremost botanists of our day have undertaken this difficult venture and propose in the course of years to offer a series of treatises on the distribution of the vegetation of the earth grouped in accordance with the geographical and topographical characteristics and division of the various continents. It is but natural that the most thoroughly studied and known main groups of the European continents are at first taken into consideration in this elaborate sketch, which will appear in independent volumes. The first one, treating the vegetation of Spain and Portugal, facing along its southern coast the long-stretched shores of the African continent with so many plants common to both floras, has just been issued. Its author, the well known botanist, Prof. Willkomm, late Professor at the University of Leipzig, has made the vegetation of these largely mountainous countries a life-long study and at his recent death has left this elaborate work as an enduring monument to his faithful and successful labors.

The volume is divided into three parts and each into various chapters. The introductory part consists of a masterly sketch of the history and the literature of the botanical study of the Iberian peninsula as far back as the 16th century. The first part of the book is divided into two large groups, treating on the physical geography of the peninsula, and on the distribution of the various plant formations over the different areas of the mountainous uplands and the lowlands of the peninsula. The second part includes descriptions of the various formations of the vegetation in general as well as for special districts. A most interesting concluding chapter treats of the changes brought on in the characteristics of the vegetation of the Iberian peninsula by migration as well as by the cultivation of plants.

This first volume of the series of sketches on the vegetation of the earth argues well for the importance, the excellence, and the paramount value of this new venture in botanical literature. The fact that two so eminent botanical scholars and one of the foremost botanical publishers have joined in the publication of a descriptive series of geographic-botanical sketches is an ample guarantee that the subsequent volumes will equal if not surpass the just issued initial volume. And this one is in every respect an excellent work which at once will command the interest and the appreciation of professional as well as of amateur botanists everywhere, and not least in the United States.

Fr. H.

Formulaire des Medicaments Nouveaux pour 1896. Par H. Bocquillon-Limousin, Pharmacien de 1re classe. 7e edition, revué, corrigée et augmentée. Librairie J. B. Baillière et Fils, Paris. 7 vol., de 300 pages, cartonné, 3 fr.

In these days of new remedies, when scarcely a week passes without the discovery of some synthetic preparation of greater or less therapeutic value, any book on new medicaments must necessarily be subject to frequent revision, if it is expected to serve the purpose for which it was intended. So the sixth edition of the "formulaire de medicaments nouveaux" has been soon succeeded by the present volume, in which many articles recently introduced into medicine have been added.

This last edition contains 455 new remedies, including crude drugs, plant constituents, and inorganic medicines, as well as synthetic organic preparations. Under each of these articles the author gives, as completely as possible in a work of this kind, the synonyms, description, composition (active principles as far as known in case of vegetable drugs), physiological action, therapeutic properties, mode of administration, and doses. To show that the work is up to date, it need only be mentioned that apolysin, citrophene, and ferripyrin are included in the list of remedies. On the other hand, it cannot fail to surprise or at least to interest American pharmacists to learn that drugs so long and so well known to us as hydrastis, cannabis indica, gelsemium, etc., are classed in the same category.

The paper and binding of the book are excellent for a work of its kind. *R. Fischer.*

Anatomischer Atlas der Pharmacognosie und Nahrungsmittelkunde. Von Dr. A. Tschirch und Dr. O. Oesterle. Lieferung 10. Chr. Herm. Tauchnitz, Leipzig. 1896. M. 1.50.

Lieferung 10 of this excellent work describes and figures Ergot, *Claviceps purpurea* Tulasne, together with the forms of *Ustilago* that attack the common cereals; the seeds of the corn cockle, *Agrostemma Githago* L., and of the cow-wheat, *Melampyrum arvense* L., frequently found as impurities in seed grain; the common pea, *Pisum sativum* L.; the common beans, *Phaseolus vulgaris* Metzg. and *P. multiflorus* Willd., and the lentil, *Evum Lens* L. A comparative study of the seed envelopes of the most important *Phaseolus* and *Vicia* forms from authentic specimens furnished by Prof. Wittmack of Berlin is a valuable feature of this number. By means of micrometric measurements of the elongated palisade cells, representing the epidermis of the outer integument of the ovule, and of the next underlying cell layer, taken in connection with the often characteristic form of the elements, the authors are able to identify a fragment from the seed coats of any of the dozen forms considered. Starches from the commoner grains are treated. A brief statement of our knowledge concerning the structure, growth and use in the plant preceeds the detailed description of starch from wheat, rye, barley, corn, oats and rice. As would be expected in this publication, full and clear descriptions are accompanied by excellent illustrations. *Rodney H. True.*

Die Cyan-Verbindungen. Ein Handbuch für Fabrikanten, Chemiker, Aerzte, Apotheker, Droguisten, Galvaniseure, Photographen, u. s. w. Nach den neuesten Erfahrungen bearbeitet von Dr. Friedrich Feuerbach, technischer Chemiker. A. Hartleben's Verlag, Wein. Ein Bd., pp. XVI, 400. Mit 25 Abbildungen. 1896. M. 6.00.

The Cyanogen Derivatives constitutes volume 224 of the Chemico-technical Library published by A. Hartleben of Vienna. Other volumes of this series have repeatedly been reviewed in the older volumes of this journal. In truly German fashion the author begins by giving in his introduction a very interesting historical account of the discovery of cyanogen compounds and of the development of our knowledge concerning this interesting group of chemicals. Although the industry of cyanogen compounds had received a severe check in its development through the introduction of coal-tar dyestuffs the manufacture of potassium cyanide has recently been greatly increased on account of the application of this chemical in the extraction of gold by means of the cyanide process in the most important gold districts.

The general part, which constitutes about two-thirds of the book, discusses in seven chapters the general properties of the cyanogen compounds; hydrocyanic acid and its salts; other methods for the preparation of cyanogen compounds; cyanic acid and its derivatives; thiocyanic acid and derivatives; ferro- and ferricyanides; the examination and valuation of cyanogen derivatives.

The second part discusses the technical application in several chapters: the effect of cyanogen derivatives on the human organism and the precautions to be taken in using them; application of cyanogen derivatives in reproduction processes; in galvanic plating; the extraction of gold by means of the cyanide solution. It thus becomes apparent that the book is of interest not only to the technical chemist, but to the druggist, the photographer and others who have some knowledge of chemistry. Many practical formulas for photographic reproduction and galvanic plating with copper, silver, gold, etc. are given.

The appendix supplies information regarding reagents and indicators, etc. The book is provided with an index. Paper, type and illustrations are of the same good quality that have characterized the earlier volumes of this series.

E. K.

Chemical Experiments, General and Analytical, for use with any Text-book of Chemistry, or without a Text-book, by R. P. Williams, Instructor in Chemistry, English High School, Boston. Ginn & Company, Boston.

This is a book of something over two-hundred pages, each alternate page being blank for notes, the first half of which is devoted to experiments in general chemistry, and the last half to tables for qualitative analysis.

The author has succeeded fairly well in the experiments given. He has aimed first, to select such as are most instructive and best illustrate the subject without being too elaborate; second, to arrange them in an order calculated to lead up by the most natural and easiest steps to a knowledge of the science; third, to make the subject fascinating by giving just enough information and suggestion to interest the experimenter and to make him work for the knowledge to be gained.

The orthography recommended by the A. A. A. S. is adopted throughout the book.

The author in his preface says, "Metal analysis has received a somewhat unique treatment. Each metal of a group is first taken separately and the analytical reactions are given. This method shows the pupil at once why a given reagent is added, and what its effect is. The group is next treated in the same way. This method clarifies the subject greatly in the pupil's mind, and is believed to be a valuable departure in teaching analysis."

The multiplication of laboratory manuals within the last decade is the, perhaps somewhat natural, result of the recognition of the fact that it is unwise to attempt the study of this science without laboratory instruction. This recognition is a great point gained in science teaching, and no high school worthy the name but has its fairly well-equipped laboratory. So far as the work before us gives instruction in general chemistry it will doubtless find a warm welcome from many teachers.

Of the analytical part the reviewer cannot speak so favorably. It is doubtful if any study leads more easily to "rule of thumb" methods of work or to habits of empiricism than does qualitative analytical chemistry as ordinarily taught. In the opinion of the reviewer, the methods of this book are such as will lead the student to feel he has accomplished his purpose when he can state with certainty the composition of the salt given him for analysis. The ability to write chemical equations or to analyze a salt does not necessarily indicate a training in logical methods of thought. But if chemical analysis is to hold a place in any scheme of education it must do so because of its value in training pupils to draw logical conclusions from observed phenomena. The more prominent faults of the analytical portion of this book are first, the want of sufficient explanatory text, and the giving of far too many tests for a single element. *W. W. Daniells.*

Bericht von Schimmel & Co. (Inhaber Gebr. Fritzsche) in Leipzig. Fabrik äther. Oele, Essenzen und chem. Präparate. April 1896.

In addition to the customary interesting information the new number of this semi-annual contains very valuable information concerning the so-called essences: bergamot oil, lemon oil and orange oil. The commercial confusion and uncertainty with regard to these products was possible on account of the generally prevailing ignorance with regard to the same. Mr. Karl Fritzsche, a son of the senior member of the firm, assisted by several consuls—among them by Mr. Nicola Siles, U. S. Vice Consul in Reggio—has spent about four months in the essence-producing districts and has made a careful study of the entire subject. The importance of the subject is manifested by figures speaking for themselves. The methods of examination worked out by the chemists of the firm are finding their way more and more into practice, so that adulteration will soon become impossible. The local consuls and government officials are taking an interest in the matter.

The report is also a valuable contribution to the geographical phase of pharmacognosy, which is still so sadly in need of more and authentic information. When the English translation of the Bericht appears the Review will as usual abstract paragraphs and chapters that are of special interest. *E. K.*

The National Formulary. Issued as a supplement to The National Dispensatory, 5th Edition. Lea Brothers & Co., Phila. Brochure, pp. 8, 115. 1896.

The most noticeable change in this publication is the introduction of the metric system of weights and measures, bringing it in conformity with that of the Pharmacopœia and scientific usage in general. The main additions to the list of formulae presented, besides those dropped from the text of the pharmacopœia are Compound Digestive Elixir, Elixir Paraldehyde, Stronger Emulsion of Oil of Turpentine, Glycerite of Guaiac, Solution of Bromide of Gold and Arsenic, Compound Powder of Acetanilid and Compound Syrup of white Pine. The formulae dropped from this edition are those of preparations admitted to the Pharmacopœia at its last revision.

Among the changes are noticed that of Elixir Gentian, Elixir Cinchona and of Chloroform Anodyne. Iron preparations with Elixir Gentian prepared according to the new formulae will not be discolored. In Chloroform Anodyne morphine sulphate is substituted for the Deodorized Tincture of Opium and the Tincture of Belladonna omitted. The title of this preparation has accordingly been changed from Mistura Chloroformi et Opii to Mistura Chloroformi et Cannabis Indicae Composita.

Other changes in title are those of the Effervescent Salts to Effervescent Powders.

Leo C. Urban.

Chemisch-technisches Repertorium. Uebersichtlicher Bericht über die neuesten Erfindungen, Fortschritte und Verbesserungen auf dem Gebiete der technischen und industriellen Chemie, mit Hinweis auf Maschinen, Apparate und Litteratur. Herausgegeben von Dr. Emil Jacobsen. 34. Jahrgang. 1895. Zweites Halbjahr. Erste Hälfte, pp. 184. Mit in den Text gedruckten Illustrationen. R. Gaertner's Verlagsbuchhandlung (Hermann Heyfelder), Berlin. 1896.

Attention has repeatedly been called to this quarterly, which supplies the technical chemist with a compilation of almost everything in which he may be interested. The quarterly brings not only abstracts of chemical articles, but also furnishes references to machines, apparatus and chemical literature. The present number contains abstracts arranged under the following groups:—

Buildingmaterials, cements, artificial stones.
Dyestuffs, dyeing and textile printing.
Fats, oils, illuminating materials and fuel.
Fermented beverages.
Tanning, the manufacture of leather and glue.
Textils.
Glass and earthenware.
Wood and horn.
Caoutchouc and guttapercha.
Cements and adhesives.
Lacquers, varnishes and paints.
Metals.

Part two will begin with food-stuffs and beverages and end with new books. The Repertorium, therefore, covers a large ground. It collects from a host of journals practically everything of interest to the technical chemist, and arranges the material for ready reference. It is a *multum in parvo* for the busy chemist and is of special importance to those who have only a limited number of chemical journals at their disposal. *E. K.*

Popular German Names of Domestic Drugs and Medicines. Compiled by Dr. Fr. Hoffmann. Revised and enlarged edition. Pharmaceutical Review Publ. Co., Milwaukee. Pamphlet; 36 pages; 50 cents.

This pamphlet which is a reprint of the one published by Dr. Hoffmann in 1892, has already become deservedly popular among pharmacists. As its name implies, it is an alphabetical list of German domestic remedies in use in this country, together with their Latin names, and references to formulas of the rarer preparations occurring in the list. *R. Fischer.*

Pharmaceutical Review.

(Formerly **Pharmaceutische Rundschau.**)

An illustrated Monthly Journal.

Published in the Interests of the Science and the Art of Pharmacy and the allied branches of Medical and Sanitary Science.

EDITED BY

DR. FREDERICK HOFFMANN AND DR. EDWARD KREMERS.

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EDITORIAL.

The Work of the Ohio Food and Drug Commission and its Lesson.

Readers of the Review may have been surprised at the silence of this journal with regard to a matter that has not only greatly interested the general as well as the pharmaceutical public, but that affected the druggists of Ohio in a most unpleasant and sensational manner. The very fact that it was a sensation was in itself sufficient justification for refraining comment. Besides, with two hostile factions accusing each other bitterly in the daily press, it was not an easy matter to get at the exact facts from a distance.

The opposition first charged the commission with barbarous methods and suggested incompetency of some of its employees. Later, fraud was intimated and then bribery was openly charged against the commission. The charges of dishonesty were too grave to be treated lightly. It is easy to say that So-and-so has been charged with bribery and then denounce him. By such premature denunciation great harm may be done.

It is comparable to lynch law. Even the most formidable of the opponents among pharmaceutical journals now admits that its accusations were too general, since the legislative committee has shown that the commissioner himself was not directly guilty. It is generally best to let the law take its due course, slow as it may be. The heated debate pro and con over the sensation of the past year has not improved matters much, but has rather made men blind to any other views than their own. Those who oppose food and drug inspection on general principles have become almost irradicably deep-rooted in their position and bitterly denounce all legislation toward this end. The public had its eyes opened to the dangers that lurk in impure foods and particularly in defective and adulterated drugs in such a sensational and irrational manner that it can scarcely be called an education. It was to them a newspaper sensation principally for the benefit of political factions.

Now that the bomb has exploded and the inevitable damage has been done it may be well for us to calmly reflect and to emphasize the lessons to be learned.

1.) Food and drug inspection, like the tariff, should never be tolerated in the hands of tinkering politicians. Germany has demonstrated to the world how pharmacies can be inspected by pharmacists and what educational qualification should be justly demanded of inspectors and public analysts. But American pharmacists would not learn. The druggists of Ohio assembled in official session at Sandusky last year disgraced themselves by not challenging the statement of one of their number that they were not able to examine their drugs, chemicals, and preparations, that they could not be responsible for what they dispensed: in other words, that they were not fitted to be pharmacists. Let us hope that the better element of Ohio pharmacists will deny such incompetency and announce that they can and are willing to assume responsibility under just laws and a reasonable enforcement of such laws.

In various cities the better elements of pharmacists have during the past year tried to correct the liquor evil that threatens to make dram shops of the drug stores. In almost all instances the large body of druggists have raised a hue and cry against such reformation. The result as a rule has been that the police took hold of the matter and made the culprit wince. The same is true of the offences against poison registry. When will druggists learn to correct these evil themselves?

2.) Our status of pharmaceutical education is too low even for reasonable demands made by reasonable legislation. Only a small percentage of the druggists in the United States have been through a college course in pharmacy, and only a small percentage of pharmaceutical graduates are capable of testing the articles they buy and dispense. Even these, on account of excessive competition, are compelled to devote their time so largely to purely commercial matters that they could not examine their goods even if they were inclined to do so.

Colleges have not held high enough the standard of education. They have often become veritable drug-mills. State boards could not be expected to maintain higher standards than those by which they had been measured.

Here lies the fundamental error in the present situation. It is lack of suitable education all around. The public has created laws ofttimes fostered by office-seeking and office-giving politicians.

The druggists have not been educated up to the requirements of the newly created laws. Men are placed in office for political belief or pull, not because they have been educated for such positions. A clash is the inevitable result. It is really surprising that we have not had more of them under existing circumstances.

Let us not display our temper and denounce all pharmaceutical legislation because occasionally it has been unpleasant or even disastrous. New laws in most instances should be enforced not according to their letter, but according to their spirit.

Druggists, on the other hand, because they have been ill treated, should not blame the law, but having secured a proper and liberal interpretation of the law, should as readily as possible educate themselves up to it. *E. K.*

The Craze for New Remedies.

The application of diphtheria serum for immunization has been followed by an exceedingly sad result, which has attracted world-wide attention. A servant in the house of Dr. Langerhans of Berlin is taken sick with the dreaded disease and is removed to a hospital. In order to protect the children immunization is suggested. The father himself makes the injection and in a few minutes the otherwise healthy child is dead. The case is the most pathetic imaginable. Whereas, even the enemies of serum therapy will sympathize with the despondent physician and father, who in the attempt to save his child lost it, yet the tragedy may teach us a lesson.

Attention is being called to the fact that this case is by no means an isolated one. Prof. Liebreich, editor of the Therapeutische Monatshefte, has called attention to the fact that in a number of instances the application of the serum was followed by prolonged disease. The best known case is that of Dr. Pistor and his seven-year-old daughter. The child was troubled with an inflamation of the throat, which, as was shown later, was not at all diphtheritic. A single injection of serum was followed by grave symptoms and the child was seriously ill for several months. Dr. Variot, who has had considerable experience with diphtheria serum and who is a disciple of serum therapy, warns against the use of the serum for immunization purposes, because the dangers connected therewith are too great. Not only have patients frequently become diseased, but in several instances healthy children died a few days after the injection.

If one considers that from the beginning men like Liebreich, Hausemann, Schleich and others have raised their warning voices one may be surprised that many still proclaim the absence of all danger in the use of serum, and that the large mass of physicians is so ready to use it. On the other hand we have ceased to be surprised long ago. There is possibly not a day in the year in which not one or more new remedies are discovered. The Farbenfabriken find it profitable not only to supply the fashions in color, but also in medicine. Young M. D.'s are as eager to gain renown in the therapeutic examination and advocacy of a new remedy, as a fashion belle is to display something striking in color or style of dress. This mania has become wellnigh universal. Even in conservative Germany this attitude has assumed such dangerous proportions that the government found itself compelled to expell several instructors from the University of Berlin for unprofessional behavior in the way of advertising an hygienic article.

The mania for new remedies has become so great that year-books on the subject are a necessity. These remedies are not the result of long-felt wants in our materia medica, but they are the result of capital seeking employment and of intense business competition in the chemical and pharmaceutical industries. This applies not only to serums and chemicals, but to vegetable drugs and galenical preparations as well. The result has been that neither physicians nor pharmacists really know their materia medica, and that people at large, who have read all about the new discoveries and their virtues in the daily press, are practicing self-medication to such an extent as to alarm even the physician. The pharmacist no longer makes his own preparations, but draws his supplies from the manufacturer. Does he stop to consider that only a small percentage of his galenical preparations can be examined, that even the Pharmacopœia does not inform him how to examine them? No, because excessive business competition does not give him time or means to examine if he would. The physician is in an equally bad plight. Many of the younger members of the fraternity have so accustomed themselves to the use of tablet triturates, pills, elixirs and other ready formulas from the manufacturer, that they could not write a rational prescription if they would. Truly a testimony of poverty. As it is, the physician had better not blame the pharmacist, nor the pharmacist the physician. Both should sweep before their own doors. If one were inclined to be pessimistic, the time certainly is opportune.

The writer, however, does not want to be misunderstood. There is need for new remedies, and there is still greater need for the careful scientific examination of new remedies. If the periodic law — and by the periodic law is meant not the pigeonholing of the elements, but the fundamental law that the properties of the elements are functions of their atomic weights — if this law be true, the physiological properties of the chemical compounds must be functions of the constitution of their molecules. By constitution is meant not only elemental but also structural composition. Studies in this direction have already been bearing excellent fruit. Pharmacological synthesis must become as simple as organic synthesis before the best results can be expected. This, however, is not the work of medical tyros.

Neither does the writer wish to denounce serum therapy. The future historian of the nineteenth century may consider the bacteriological remedies of our generation (crude as they are at present) as among the greatest discoveries of the age. No person will deny the great service of chloroform, because now and then a patient has died on the operating table under the influence of this great alleviator of pain.

It is not the new remedy, which the writer attacks, it is the craze for something new which he denounces. No person will be cruel enough to accuse the distracted father in Berlin of having killed his child. All will feel the greatest sympathy for him. But this lesson should ultimately be learned by the physician, the chemical and pharmaceutical manufacturer, and by the public at large that new remedies are not playthings. The denunciation of alcoholism and the opium habit are to be commended, but while combatting old evils we should not become blind to the new. *E. K.*

ORIGINAL CONTRIBUTIONS.

The Periodides of the Alkaloids, as Molecular Forms for Volumetric or Gravimetric Estimation.

By Dr. *Albert B. Prescott.*

PREFATORY.

It is manifest that a clear understanding of molecular forms is the groundwork of quantitative analysis, inorganic or organic. When the molecular constitution of the compound that is produced in any quantitative operation is well known, then the way is open for an intelligible study of the conditions of the operation, and for an exact measure of the physical constants of the product of the operation. Studies of the structure of complex acids, such as the compounds of molybdenum oxides with phosphorus and arsenic, have pointed the way for control of quantitative operations such as are made in analyses of metals.

In estimating alkaloids, in many cases there is no other method than to separate the free base as nearly pure, and with as little waste, as possible, and take the weight as it is. Whether by precipitation from water solution, or by washing out with immiscible solvents, this direct determination is quite practicable for such sharply defined bodies as the alkaloids, with their clearly drawn limits of solubility. But the same strong chemical individuality goes still more to strengthen methods of estimating the alkaloids as compounds. So sharply cut are their reactions, it is reasonable to expect the best of quantitative methods based on their reactions of combination.

Alkaloids combine by addition. The compounds most used, hitherto, in the estimation of the alkaloids, may be enumerated about as follows, taking those first which have been used earliest in the progress of analysis:

1. The Platinum Chlorides of the Alkaloids. (Their Gold Chlorides.)
2. Their Mercury Iodides. (Bismuth Iodides, etc.)
3. Phosphomolybdates. (Other conjugated phosphates.) (Picrates.)
4. Their common salts, as concerned in their volumetric reactions with acid and with fixed alkali, using selected indicators for free alkaloid.
5. Their Periodides. (Other perhalides.)

In a brief reference to each of these classes of combination we can only briefly note their character in molecular constitution and their value, or promise of value, in analytical work.

The platinum chlorides, which are apt to crystallize well, have been favorite forms for the determination of the combining number, indicative of the molecular weight, as well as merely for close separation from non-alkaloidal matter. The melting point of the platinum chloride is a standard constant. In constitution these double halides were studied by Jörgensen ten years ago.*

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* J. prakt. Chem., 141, p. 489.

The mercuric iodides of the alkaloids had their history told, with the biography of Ferdinand F. Mayer, by Prof. Schaer of Strassburg and by Dr. Frederick Hoffmann, in the German series of this Journal in 1894.[1]

I should like to enlarge upon the historical relations of the note I gave Dr. Hoffmann at that time[2], but it would be a digression from the present subject. The slender investigation I have made of alkaloid iodomercurates[3], I would gladly continue for their scientific promise, but without expectation of analytical benefit. Although Mayer's reagent has been introduced into the last revisions of the Pharmacopœias of Germany and the United States, it is not the volumetric reagent most likely to be finally adopted for alkaloids.

The estimation of alkaloids by volumetric methods of alkali-measure, that is by alkalimetry, has been gaining ground steadily for the last ten years, and is receiving contributions of permanent value from the Committee upon Indicators in the American Pharmaceutical Association. As exact and comparative studies of indicators, these contributions will be helpful in a wide range of chemical operations. But they are more than simply studies of indicators, they are studies of the response of alkaloids to indicators and studies of the limits of analytical error, general and personal, in alkaloidal estimations. All the indicators save one act by reaction of the free alkaloid, in distinction from the salt of the alkaloid. This one indicator, phenolphthalein, not affected at all by free alkaloid, can be used to record the presence of free metallic alkali, when this appears, after neutralizing the mineral acid of alkaloidal salts. So then, if we can first know that we have a strictly neutral salt of an alkaloid, we can indirectly estimate the alkaloid of the salt by an acidimetry of its combined acid.

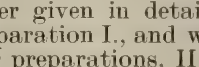
As a volunteer worker with the Committee on Indicators, my contribution to their work was made at the last meeting of the A. Ph. A., and is given in separate text in their report[4], although my results are tabulated along with those of the four other workers. For my results I was indebted to the very discriminative labor of Mr. Scotten and Mr. De Jonge, who worked together, with double safeguard against the avoidable errors of observation. The analytical error of this method is still too large. This is manifest in comparing the figures of one analyst with those of another analyst, or those of the same analyst by one indicator with those by another indicator of about equal availability, or even in comparing successive titrations of the same analyst with the same indicator. It may reasonably be hoped that conditions may be found which will greatly diminish the analytical error. It can hardly be expected that the method will be ever made sharp enough for satisfactory adoption in the Pharmacopœia. There is at any rate this much in its favor, its results do not appear with misleading sharpness like those often obtained from Mayer's solution, or not unless inorganic alkali be present as an impurity in the alkaloid under estimation. It is to be remembered that, in alkalimetry of alkaloids, inorganic alkali represents five to ten times its weight of alkaloid, and gives a sharper reaction.

The periodides are more than alkaloid addition compounds, they are halogen addition compounds as well. I have presented a critical history of progress in the study of both inorganic and organic periodides[5], which has been published in the last volume of this journal.[6] Taking pyridine as the primary type of periodides, it was desired, both as a study in the pure chemistry of pyridine derivatives, and as likely to give a basis for analytical work, to search the synthetic possibilities of pyridine in combination with iodine. This work has been well carried out by Mr. Trowbridge who has it still going on in this laboratory, in consultation with myself. These periodides are clear cut, in crystalline form, and not too instable for close accord of successive iodine estimations. The superiodides of the pyridine-alkyl iodide, such as $C_5H_5N\begin{smallmatrix}\diagup CH_3\\ \diagdown I\end{smallmatrix}$, are, however, much more stable than the superiodides of pyridine di-iodide, $C_5H_5N\begin{smallmatrix}\diagup I\\ \diagdown I\end{smallmatrix}$, if the latter be assumed as the base of its periodide, $C_5H_5NI_4$. Pyridine previously combined with an alkyl iodide, presenting a quaternary base, holds iodine much more firmly than pyridine not so combined, presenting only a tertiary base.

Now, in an analogous way, Dr. Gomberg finds, as given later on, that caffeine with a mineral acid, as HCl, forms a delightfully stable periodide, giving sharp volumetric estimations, although caffeine in neutral solution does not combine with iodine, or not directly nor readily. It is this necessity of the presence of an acid, for the formation of caffeine periodides, that has caused their precipitation to be overlooked hitherto, because caffeine, being freely soluble in water with neutral reaction and not having salts soluble in water without dissociation, is known and treated as a free base. And the very instructive discovery of Dr. Gomberg, that iodine and a mineral acid will precipitate caffeine perfectly, has its starting point in the discovery of the effect of the mineral acid, when caffeine and iodine are present.

PERIODIDES OF PYRIDINE.[7]

I. Pyridine Alkyl Periodides.

Type, 

$$C_5H_5N\begin{smallmatrix}\diagup C_nH_{2n+1}\\ \diagdown I.I_n\end{smallmatrix}$$

1. *Pyridine Methyl Pentiodide.*—This was obtained in the manner given in detail below, very satisfactorily in preparation I., and with slight impurity in two other preparations, II. and III., by different ways, through separation from other periodides.

Preparation I. is in greenish-black long needles of very dark green luster, some of the crystals being nearly two inches in length. The melting-point is 47.5° C.[8]

Preparation II. is of small quantity, in greenish-black crystals, very hard and compact, melting at 47° C.

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[1] Phar. Rundschau, 12, pp. 125, 142.

[2] Loc. cit., p. 146.

[3] Am. Chem. J., 2, p. 294; 14, p. 606.

[4] Proc. Am. Pharm. Assoc., 43, p. 187.

[5] Am. Assoc. Adv. Sci., August, 1895; J. Am. Chem. Soc., 17, p. 775.

[6] Pharm. Rundschau, 13, p. 233.

[7] A paper by A. B. Prescott and P. F. Trowbridge, read at the Springfield Meeting of the American Association for the Advancement of Science, August, 1895.

[8] Measurements of the crystals, and various optical determinations, as well as work by other physical methods, especially such as bear on molecular weight and constitution, are reserved together for a continued investigation of these bodies.

Preparation III. is in crystals exactly like I., melting at 47° C., by recrystallization in alcohol from a greenish-black crystalline powder, the latter being stable and melting at 43° C. The analysis of III. was obtained only from this powder, before the final crystallization. These three preparations are, alike, so far stable that after keeping eight months in glass-stoppered bottles, most of the time in the dark, the glass is but just perceptibly stained with iodine liberated from decomposition.

The analyses of the methyl pentiodide, by methods detailed further on, gave results as follows:

	Calculated for $C_5H_5N.CH_3I\ I_4$.	Found. I.	II.	III.
Iodine total	87.06	86.74	......	86.69
Iodine by titration	69.65	68.87	69.83	69.55

2. *Pyridine Methyl Diiodide.*—Obtained through different ways, as stated later, in two preparations. I. is in reddish-brown crystals, thick plates, compact in clusters. Some crystals are an inch long and a fourth of an inch wide. Melting-point, 91.5° C. The crystals are very stable. On eight months' standing there are no perceptible results of decomposition. II. is in red interlaced fine needles of good length, the last previous crystallization having been in dark-red sheaf-form clusters of great beauty. Melting-point, 91.0° C. In stability II. is equal to I.

The analyses, with duplicates as specified later, gave the following:

	Calculated for $C_5H_5N.CH_3I.I$.	Found. I.	II.
Iodine total	72.91	72.88	72.33
Iodine by titration	36.55	36.97	36.40

3. *Pyridine Methyl Triiodide.* — Obtained in three preparations, each from a separate recrystallization out of a common mother-liquor, that of II. of the methyl diiodide. Again it is obtained in the first crystallization by another method, that for IV. I. is in dark-red fine needles, quite perfect in outline and partly clustered in certain sheaves characteristic of the earlier crystallizations of this triiodide. Melting-point, 50° C. Perfectly stable.

II. shows dark-red needles, the previous crystallization having been merely a loose crystalline mass. Obtained perfectly stable, with melting-point of 50° C.

III. is dark-red needle clusters of a certain exact sheaf-form appearing illusively in several earlier crystallizations. But a small quantity was obtained, with a melting-point of 49°—50° C.

IV., perhaps the most perfect, is in very dark red or reddish-black plates with needles, perfectly stable, and melting at 48° C.

The results in analysis have been these:

	Calculated for $C_5H_5N.CH_3I.I_2$.	Found. I.	II.	III.	IV.
Iodine total	80.14	79.32	79.22	......	78.70
Iodine by titration	53.43	53.08	51.52	52.75	53.15

4. A product was obtained of seeming distinct character, in composition and melting-point nearly approaching the pentiodide, but with the elemental figures of a tetrapentaiodide, that is dipyridinedimethylenneaiodide. It is reserved for further work. It is in greenish-black, lustrous, long needles, well defined, of a melting-point of 44° C. The total iodine in three successive determinations was found to be, respectively, 85.83, 85.88, and 85.83 percent; calculation for $(C_5H_5N.CH_3I)_2I_7$ giving 85.68 percent, and for $C_5H_5N.CH_3I.I_4$, 87.06 percent. The iodine by titration was found to be 67.52, 67.08, 67.02, and 66.69; calculation giving for these formulas, respectively, 66.45 and 69.65 percent.

5. *Pyridine Methyl Octaiodide.*—This product is named provisionally, one fairly satisfactory preparation of it being obtained, a second preparation having the requisite composition but (possibly from its more compact crystallization) having a higher melting-point, and a third preparation, while agreeing in melting-point with the first, falling too low in percentages of iodine. The preparation, detailed below, was instituted in the hope of obtaining the enneaiodide. I., by recrystallization from alcohol below 0° C., is greenish-black, in both plates and needles, melts at about 26° C., and is fairly stable when kept at about 15° C. or below. II. is in crystals of the same color as those of I., but more slowly formed and more compact, consisting of flat needles, some of them an inch long, with melting-point of about 41° C. III. was imperfectly crystallized, rather solidified in a crystalline mass, of the color of I., and melting at 25° C. We do not include III. among the determinate preparations. It gave of total iodine, 90.36 percent, and of iodine by titration 78.41 percent, both figures being low for the octaiodide and much too high for the heptaiodide.

	Calculated for $C_5H_5N.CH_3I.I_7$.	Found. I.	II.
Total iodine	91.51	90.79	90.99
Iodine by titration	80.07	79.82	80.13

6. *Pyridine Ethyl Triiodide.* — Obtained, as specified under the account of preparations, from liquid secondary products corresponding to those which gave the three samples of the pyridine methyl triiodide, in lustrous greenish-black needles, well defined, stable through exposure to the air, and melting at 49° C. In the analysis, two determinations by silver iodide gave for iodine 78.389 and 78.388. Three titrations with the thiosulphate gave for iodine 52.784, 52.612 and 52.616. Inasmuch as the mother-liquids have been found to contain higher periodides, it is evident that these crystals are not wholly freed from mother-liquid.

	Calculated for $C_5H_5N.C_2H_5I.I_2$.	Found.
Iodine total	77.85	78.39
Iodine by titration	51.90	52.67

7. Higher ethyl periodides of pyridine, in nearly black crystals melting below 10° C., were indicated from treatment of the primary oil-like product, though not yet obtained in purity, as stated under the preparation of the triiodide.

Methods of Preparation.—The methyl periodides of pyridine are best obtained, first, by adding the methyl normal iodide of pyridine to dissolved iodine. We have also obtained several pyridine methyl periodides, second, by adding pyridine to a solution of methyl iodide and iodine. We have found, however, as stated further on, that in the latter way there is formed some proportion of a pyridine periodide destitute of methyl, though the avidity of pyridine for methyl iodide ensures a considerable proportion of methyl periodides. For pyridine ethyl periodides the second way would not promise formative results at all, owing to the tardy addition of ethyl iodide to pyridine. The normal pyridine alkyl iodides used were prepared for the purpose, and had the properties specified in another paper by one of us (P), in which, also, is a statement of the constants of the pyridine used in these preparations. In adding the pyridine alkyl normal iodide to iodine, the latter was taken in the proportion to make the particular periodide desired, but other periodides would appear as subordinate products. As to just how much effect the relative quantity of iodine added exerts upon the extent of iodine combination, further investigation is now in progress.

The preparation of pyridine methyl pentiodide was done as follows: Eighteen grams of pyridine methyl iodide dissolved in a little alcohol were added to fifty grams of iodine previously dissolved in 200 cc. of alcohol, the solutions being taken at low temperature. A dark green oil-like liquid, thick and cohesive, at once separated in abundance at the bottom. The thin alcoholic liquid above was decanted off and the oil set aside at a temperature several degrees below 0° C., when it shortly solidified in crystals, not melting at 25° C. These were dissolved in warm alcohol, and the solution set aside at about —5° C., when crystals of preparation I. appeared. They were dried over sulphuric acid to a constant weight, for analysis and determination of the melting-point. This periodide was undoubtedly obtained in its amorphous oil-like state by O. Lange in 1885[9] while engaged in obtaining decomposition products of pyridine methyl iodide by Ladenburg's process. He reported obtaining the heavy dark-green oil, which would not solidify on standing for a day, and which he apparently did not analyse.[10] III. of the methyl pentiodide was obtained by treating a part of the first crystalline form of the methyl octaiodide before described, with ether, which dissolves a small portion of the crystals, leaving the remainder as this preparation III. of the pentiodide. Preparation II. of the methyl pentiodide was obtained from the mother-liquor of the methyl octaiodide by evaporation and redissolving the crystals in alcohol.

The preparations of the pyridine methyl diiodide in I. and II. were from solutions quite different from each other from the beginning, but in both cases they were from later crops of crystals following the addition of free pyridine to solution of the other two materials. The final crystals of I. were washed in a very little cold alcohol, and then dried over sulphuric acid for ten days. The crystals of II. were obtained fine by rapid formation in alcohol surrounded by a freezing mixture.

The preparations of pyridine methyl triiodide in I., II. and III. were crystallized from the mother-liquids of II. of the corresponding diiodide. II. of the triiodide was itself recrystallized several times. I. and III. were in more compact crystals of slower formation. But IV. was the result of a different method throughout, following the addition of iodine solution to the methyl normal iodide, using proportions intended for the diiodide. The final crystals were by a single recrystallization of the first crop. It was dried between filter papers over sulphuric acid.

The preparations of pyridine methyl octaiodide (provisionally so termed) were instituted by adding eleven grams of the normal iodide dissolved in a little alcohol, to fifty-five grams of iodine in as little alcohol as possible, both solutions being hot. The greenish-black oil-like mass separated at once. The decanted solution was cooled, and other portions of the oil obtained. Below 0° C. the oil crystallized well. I. was crystallized from solution in alcohol at low temperature. II. was crystallized from alcohol by spontaneous evaporation out of doors in cool weather. The final crystals of each were dried between filter papers, and kept in the vault at about 12° C.

Pyridine ethyl triiodide was obtained following the addition of alcoholic solution of the normal iodide to alcoholic solution of iodine. The first product, chiefly higher iodides, appeared in an oil-like precipitate, and this, after decanting the alcoholic liquid, was dissolved in hot alcohol, and the solution kept for six hours at —4° C. without obtaining crystallization. Afterward crystals were obtained but without success in drying them. Moist with the oil they gave figures a little too low for the tetraiodide. Repeating the entire operation, but not decanting the oil, the entire mixture was exposed to low temperature as before, and the oil solidified in a mass of fine crystals better than before, but these melted below 10° C., and the attempt to obtain a pure high periodide had to be deferred. That the oil, which is stable when dried and has no odor of iodine, contains high iodine additive combination was shown by its analysis, giving figures midway between hexiodide and heptiodide. Now the alcoholic liquid decanted from the oil in the first operation, on cooling below 0° C., gave an excellent crop of crystals. These, dried for several days over sulphuric acid, at about 21° C., constitute the preparation described under the name pyridine ethyl triiodide.

II. Periodides of the Amine and of the Tertiary Ammonium Base.

$$\text{Type, } C_5H_5N\begin{matrix}\diagup I.I_n\\ \diagdown I.I_n\end{matrix}$$

1. *Pyridine Tetraiodide*, $C_5H_5N.I_4$.—Adding to pyridine an alcoholic solution of iodine until the precipitate ceased to form, thereby leaving a slight excess of iodine, there was obtained a bulky crystalline precipitate of a green color, not of a red color as reported by Dafert.[11] This precipitate was filtered out, drained, washed with alcohol, and drained dry, all under the filter pump, then dried between filters over sulphuric acid for several days. It was found soluble in alcohol, ether, chloroform, and less readily in benzene. It was recrystallized from benzene in I., from chloroform in II., and from alcohol in III. In each result the crystals were dark lustrous green. Those of III. were in button-like aggregations of fine needles, the whole about half an inch in diameter. From each solution the crystals showed the same melting-point, 85° C. The alcoholic mother-liquor on evaporation gave a crop of very small dark-green crystals, IV., of the same melting-point. All these crystals gave off perceptible traces of iodine on standing in a glass-stoppered bottle, being very perceptibly less stable than the crystal preparations of the various pyridine *quaternary* base periodides already de-

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[9] On Picolines, Ber. d. Chem. Ges., 18, p. 3436.

[10] It was in following Lange that this preparation I. of the methyl pentiodide was first undertaken, and the "oil" obtained. After fruitless attempts to crystallize it from various solvents, it was abandoned for six weeks, when, on one very cold day, in moving things it was set in the window next the glass, and presently it became a mass of crystals. These did not melt when returned to the warmer air of the laboratory. A new preparation was at once commenced as above.

[11] 1883, Monatsh. Chem., 4, p. 509.

scribed. This instability may be the cause of the slight deficiency of iodine found in analysis, the resulting figures being as follows:

	Calculated for $C_5H_5N.I_4$.	Found.			
		I.	II.	III.	IV.
Iodine total by silver iodide,	86.49	85.72	85.94	85.63	85.48
Iodine by titration with thiosulphate,		85.05	84.79	85.73	85.63

This periodide, therefore, contains no iodine firmly bound as in all normal iodides, none that is not promptly taken up by thiosulphate. In this constitutional feature it is a periodide sharply unlike all the pyridine alkyl periodides known, and unlike the pyridine hydrogen pentiodide found by Dafert,[12] and further described below as examined by us. A superbromide of pyridine was obtained, in 1882, by Grimaux,[13] who writes for it the formula, $(C_5H_5NBr_2)HBr$. He found it not very stable; in analysis he made but one estimation of bromine, that by silver bromide; and he found the compound reduced by hydrogen sulphide to pyridine hydrobromide and hydrobromic acid. The triethylphosphine tetraiodide, $P(C_2H_5)_3I_4$, inferred by Masson and Kirkland in 1889,[14] is of the same type as our pyridine tetraiodide. Treated with hydrogen sulphide half its iodine entered into phosphonium normal iodide, and half into hydriodic acid.

Several months before the preparation of pyridine tetraiodide as above given, a product was obtained in another way which puzzled us at the time, but which we now recognize as this last-formed pyridine tetraiodide. It was obtained in the first crystalline precipitate after adding free pyridine to the solution of methyl iodide and iodine, in the second way for making the methyl periodides. The mother-liquor of the precipitate gave us the methyl diiodide, preparation I. of that product. The precipitate itself crystallized from a chloroform solution, gave very dark green short needles, melting at 84.5° C., and soluble in ether and in benzene. The total iodine was found as 86.32 percent (the average of four results, lowest 86.22, highest 86.50). At that time a satisfactory titration for iodine was not obtained on account of the solvent, but without any solvent one slow titration resulted in 85.82 percent, indicating the absence of normal iodine, when the preparation was put aside for later inquiry. It appears, therefore, that when free pyridine is added to methyl iodide and iodine, in alcoholic solution of each, some periodide of pyridine without methyl is formed in the first precipitate, notwithstanding the extreme avidity with which pyridine unites directly with methyl iodide.

2. *The Pyridine Hydrogen Pentiodide of Dafert.*[15] — This was obtained, following the plan given by that author, in crystals such as described by him, melting at about 85° C. (Dafert 89° C.) In analysis it gave 88.03 percent of total iodine, and 70.20 percent of iodine by titration (calculation for $C_5H_5N.HI.I_4$, total iodine 88.77 percent, and superiodine 71.02 percent.) For the titration the periodide was dissolved in alcohol, the end reaction was sharp, and the result conclusive as to the fundamental difference between the two compounds, one of which we believe to be a periodide of C_5H_5NH, and the other of C_5H_5N.

A hydrogen periodide of pyridine, therefore, like alkyl ammonium periodides in general, includes for each atom of nitrogen (in the molecule whatever its magnitude) just one atom of iodine which is left united to the nitrogen after the action of reducing agents of sufficient strength. On the contrary the periodides of pyridine not having ammonium hydrogen or alkyl contain no iodine left by such reducing agents in union with the base, as we say, no iodine firmly bound. Various forms of these two types may be represented as follows:

(1) $R_4NI.I_n$, quaternary alkyl ammonium periodides.
$(R'''N)RI.I_n$, quaternary pyridine periodides.
$(R'''N)HI.I_n$, pyridine hydrogen periodide.
(2) $(R'''N).I_n$, pyridine (amine) periodide.
$(R''N)Br_2HBr$, a superhalide (Grimaux).
$R_3PI_n.I_n$, inferred by Masson and Kirkland.

III. Estimation of the Iodine of Periodides.

1. The total iodine is obtained by precipitation as silver iodide, weighing this on filters to be described later.

The sample is weighed, from a weighing bottle, by difference, into a No. 2 beaker. About twenty cc. of a saturated solution of sulphurous acid is added, then a slight excess of silver nitrate solution (used of known strength). The mixture is heated on the water-bath for about an hour, breaking the crystals of periodide if necessary with a flat end of a glass rod, then acidulated strongly, using twenty or thirty cc. of nitric acid, (sp. gr. 1.20), and heated one to two hours or until the precipitate is of a uniform light straw color and the liquid perfectly clear. The precipitate is then put upon the prepared funnel of ascertained weight and washed, first with five percent nitric acid and then with hot water, using the pump throughout. The funnels are small sized "carbon tubes," the bottom loosely fitted with a glass plug or shoulder, on which is a layer of cracked glass, twelve to twenty mm. thick, made from beakers and sieved to pass a ten-mesh but not a twenty-mesh. After this is washed level, under pressure of the filter-pump, a layer of acid-washed asbestos is floated over it, and the whole dried at 130° to 150° C. for about two hours or for constant weight. Weighing is done with duplicate funnels, suspending them with an aluminum loop.

The washed silver iodide in the funnel is dried, with its duplicate (also wetted), for two hours at 130° to 150° C., or until weight is constant. A set of about thirty of the funnels have been in hand, and when all have been used, the asbestos layer and precipitate are carefully removed, and a fresh asbestos layer floated on, all which can be done for the set in about two hours.

Two to four parallel estimations have been made, and the average taken. The agreement of the estimations is fairly shown in these figures, quoted from the results: 86.69, 86.79, 86.84, 86.66; 72.45, 72.08, 72.45; 86.65, 86.29.

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[12] F. W. Dafert, 1883, Monatsh. Chem., 4, p. 508. Dafert says, p. 509: "In alkoholischer und in wässeriger Lösung des Pyridins erzeugt Iod in Alkohol, respective in Iodjodkaliumlösung, ebenfalls unter gewissen Umständen eine Fällung. Eben so bei Anwendung von Schwefelkohlenstoff. Das dabei erhaltene Präparat ist roth gefärbt und jedenfalls mit dem obigen Superiodid *nicht* identisch. Eine weitere Untersuchung wird wohl Näheres ergeben." We have not been able to find a further publication by Dafert upon this compound.

[13] E. Grimaux, Compt. rend., 95, p. 87; Bull. Soc. Chim., 38, p. 127.

[14] J. Chem. Soc., 55, p. 139.

[15] 1883: Monatsh. Chem., 4, p. 508.

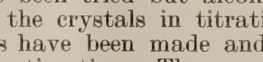
2. The iodine in excess of that for a normal iodide, that is, the iodine responding to reducing agents, has been estimated volumetrically by thiosulphate, using a solution of which one cc. equals 0.010 of iodine. To make this solution, "C. P. sodium thiosulphate" is recrystallized small by stirring while the solution cools. The volumetric solution is standardized by standard solution of potassium dichromate, which in turn is checked with one standardized with "chemically pure" iron wire. The dichromate is purified by fusing a chemically pure article and pouring upon a tile. The factor of the thiosulphate solution is taken every two or three days. The periodide analyzed is weighed by difference, from a weighing bottle into a No. 3 beaker, taking 0.150 to 0.600 gram. Of alcohol from ten to fifteen cc. are added. All the periodides so far obtained are soluble in cold alcohol, but with much difference in the readiness and abundance of this solubility, and this property governs the speed of the estimation. The crystals can be broken under a flat end of a rod, and if not readily soluble, the titration is commenced before solution is completed, keeping down the excess of the iodine-like color. At the end starch can be used as an indicator, but after practice this is not necessary, as the extinction of the iodine-like color can be read to within one drop of the thiosulphate. The burettes had been calibrated and were used with a table of corrections. Other solvents have been tried but alcohol proves far the best for the crystals in titration. Two to four titrations have been made and the average given in each estimation. The agreement of the titrations is represented by a few quotations; of the pyridine methyl diiodide, 37.01, 37.24, 36.48, 37.17; pyridine methyl triiodide, 78.55, 78.84.

DIPYRIDINE NORMAL IODIDES.

Along with the study of pyridine superiodides has been carried a study of the normal double iodides of pyridine. Mr. R. F. Flintermann, working with the writer, in the course of considerable work upon the reactions of pyridine with dihalogen substituted hydrocarbons, obtained dipyridine trimethylene dibromide, with determination of its molecular weight and its constants, in comparison with those of its homologues, and with corresponding compounds of the alkylamines.[16] A comparison of these bodies may be made as follow:

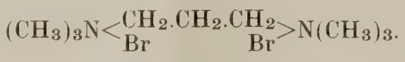
From trimethylamine:

The ethane derivative,[17]



$$\mathrm{(CH_3)_3N}<\begin{matrix}\mathrm{CH_2.CH_2Br.}\\ \mathrm{Br}\end{matrix}$$

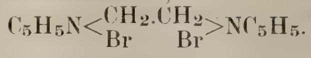
The propane derivative,[18]



$$\mathrm{(CH_3)_3N}<\begin{matrix}\mathrm{CH_2.CH_2.CH_2}\\ \mathrm{Br\qquad\qquad Br}\end{matrix}>\mathrm{N(CH_3)_3.}$$

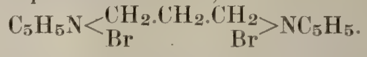
With pyridine:

The ethane derivative,[19]



$$\mathrm{C_5H_5N}<\begin{matrix}\mathrm{CH_2.CH_2}\\ \mathrm{Br\qquad Br}\end{matrix}>\mathrm{NC_5H_5.}$$

The propane derivative,[20]



$$\mathrm{C_5H_5N}<\begin{matrix}\mathrm{CH_2.CH_2.CH_2}\\ \mathrm{Br\qquad\qquad Br}\end{matrix}>\mathrm{NC_5H_5.}$$

The reaction of pyridine with other di-halogen substituted hydrocarbons is being studied in this laboratory by Mr. S. H. Baer and myself, with interesting results nearly ready for publication.

PYRIDINE ALKYL NORMAL IODIDES.

The study of pyridine superiodides made demand for the preparation of new pyridine normal iodides, and a fuller examination of such as had been reported. This work enabled us to bring out certain interesting relations between the physical constants of the homologues of this class, as follows:[21]

Quaternary Base Iodides.

	Melting points.	Boiling points of the free alkyl iodides.
With homologous alkyls:		
Pyridine methyl iodide.....	117°[22]	45°
Pyridine ethyl iodide.......	90.5°[22]	72°
Pyridine propyl iodide....	52-53°[23]	102°
(Pyridine butyl iodide decomposes before melting[24]........		130°)
α-Picoline methyl iodide	226.5-227°[25]	45°
α-Picoline ethyl iodide..... under........	100°[26]	72°
With isomeric alkyls:		
Pyridine isopropyl iodide	114-115°[23]	89°
Pyridine propyl iodide....	52-53°[23]	102°

Quaternary Base Metallic Chlorides.

(Pyridine tertiary butyl salts are not formed)[24]		100°
Pyridine isobutyl platinum chloride........	220°[24]	119°
Pyridine isobutyl gold chloride........	139°[24]	
Pyridine secondary butyl platinum chloride.........	191°[24]	119°
Pyridine secondary butyl gold chloride........	129°[27]	
Pyridine normal butyl platinum chloride.........	205°[24]	130°
Pyridine normal butyl gold chloride........	111°[27]	
With homologous tertiary bases:		The free tertiary bases.
Pyridine methyl iodide...	117°[22]	160°
Picoline methyl iodide	226.5-227°[25]	132-140°

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[16] The full report of this work was read at the Springfield Meeting of the American Association for Advancement of Science, last August, and has been published, under names of R. F. Flintermann and A. B. Prescott in Journal American Chemical Society, 18, p. 28, (Jan. 1896.)

[17] A. W. Hoffmann, 1858: Proc. Roy. Soc., 9, p. 293. "Addition of nitrate of silver precipitates only one-half of the bromine as bromide of silver, while even by protracted ebullition the second half remained untouched."

[18] G. Kleine, 1894: Chem. Centrbl., 1, p. 16, from Zeitschr. Naturwissenschaften, 66, p. 1. Kleine found a smaller proportion of the mon-ammonium product.

[19] Davidson in the London Laboratory of A. W. Hofmann, 1681: Proc. Roy. Soc., 11, p. 261; J. Chem. Soc., 14, p. 161.

[20] R. F. Plintermann, loc cit.

[21] From a paper read at the Springfield Meeting of the American Association for the Advancement of Science, August, 1895, and published in full in Jour. Am. Chem. Soc., 18, p. 91.

[22] Trowbridge, this Laboratory.

[23] Baer, this Laboratory.

[24] Lippert: Ann. Chem. (Liebig), 276, p. 182.

[25] Ramsay: Phil. Mag. (5), 4, p. 241. Before the constitution of picoline was established. It is not necessary here to distinguish between isomeric picolines.

[26] Anderson: Ann. Chem. (Liebig), 94, p. 361.

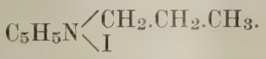
Comparing two isomeric addition compounds:		Ter. base.	Alk. iod.
Pyridine ethyl iodide, $C_5H_5N.C_2H_5I = C_7H_{10}NI$...	90.5° [22]	116°	72°
Picoline methyl iodide, $CH_3.C_5H_4N.CH_3I = C_7H_{10}NI$..........	227° [25]	132°	45°

The iodides of these quaternary bases give constants more distinctive of composition than do the platinum chlorides, at least so far as melting points of the iodides are available. In tabulating the melting points of the pyridine alkyl iodides it appears that, comparing homologues and again comparing isomers, the melting points of the addition products fall as the boiling points of the free alkyl iodides rise.[27] The same reverse ratio appears among picoline alkyl iodides. On the contrary, comparing pyridine methyl iodide with picoline methyl iodide, the two tertiary bases being homologous and the alkyl iodide being the constant factor, it is found that the melting point of the addition compound rises as the boiling point of the tertiary base rises, and in an extreme proportion.

THE PYRIDINE ALKYL HYDROXIDES.

As further bearing upon the character of pyridine derived bases, the hydroxides were further studied by Mr. S. H. Baer, who also prepared some not previously reported. It may be well to give here the properties of two of these quaternary hydroxides, as free bases:

Pyridine Propyl Hydroxide.[28]



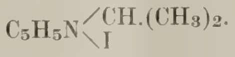
$$C_5H_5N\begin{matrix}\diagup CH_2.CH_2.CH_3.\\ \diagdown I\end{matrix}$$

Pyridine propyl iodide, prepared in this laboratory, was treated with moist recent silver oxide, shaking for some time in a flask, keeping down the temperature. The silver oxide for all this work was made by precipitating silver nitrate with potassium hydroxide and washing the precipitate until the washings give no color reaction with hematoxylin, to ensure the removal of the alkali. Silver oxide is sufficiently soluble in water for its solution to color litmus or phenolphthalein.

On filtering out the silver iodide, the solution of pyridine propyl hydroxide was colorless, and was found to precipitate salts of lead, silver, copper, iron, aluminum, chromium, cobalt, and nickel, an excess of the hydroxide dissolving only the precipitates of lead and of aluminum, these reactions agreeing with those of fixed alkalies.[29] In parallel treatment with pyridine it was found not to precipitate these salts, the only apparent reaction with any of them being a blue color with the copper salt. The solution of pyridine propyl hydroxide gave the alkaline reaction with the following indicators: litmus, phenolphthalein, brazil wood, cochineal, hematoxylin, and methyl orange. Pyridine gives an alkaline reaction with all these indicators except phenolphthalein and hematoxylin, these two being capable of use in a volumetric acid estimation of the pyridine propyl hydroxide in presence of pyridine.

On heating the solution of the pyridine propyl hydroxide it acquires a red color, and the solid residue by evaporation has a black color, dissolving in water again as a red solution.

Pyridine Isopropyl Hydroxide.[30]



$$C_5H_5N\begin{matrix}\diagup CH.(CH_3)_2.\\ \diagdown I\end{matrix}$$

This base was prepared in the same manner as the normal propyl hydroxide, and it was found to give the same reactions with indicators and with metallic salts, as well as the same color when evaporated.

The isopropyl base has been elsewhere stated by us to form a more stable iodide, of higher melting point and lower solubilities, than the iodide of the normal propyl base, and the isopropyl hydroxide has been taken, instead of the normal propyl hydroxide, in our further experimentation.

The production of the pyridine isopropyl hydroxide, in solution, can be made quantitatively complete as a base saturating sulphuric acid. Weighed portions of the iodide were converted to hydroxide in solution, with due precautions against loss, and the liquid titrated with tenth normal solution of sulphuric acid, using hematoxylin and cochineal, respectively, as indicators, and titrating back to the end reaction with tenth normal solution of potassium hydroxide. The hematoxylin was used in a titration to avoid interference by free pyridine, should this be present as a product of decomposition, as it does not color this indicator. The cochineal was used because it is an indicator of special delicacy for titration of pyridine alkyl hydroxides.

The results were as follows: the percentage of hydroxide calculated from the iodide being 55.82, the percentage of hydroxide found by titration with cochineal was 55.25 and 55.88, with hematoxylin it was 55.6 and 55.7.

The solution of pyridine isopropyl hydroxide, on evaporation to dryness, yields a black residue, which is permanent, so that after standing three months it gives with metallic salts all the reactions of the hydroxide. The color in solution changes to red, like that of the normal propyl hydroxide. By exposure to the air it is steadily converted to the carbonate.

When the solution was treated for some time with carbon dioxide gas, then evaporated to dryness, the residue was found to bear the composition of a normal carbonate of the univalent base. This composition was determined from the amount of carbon dioxide recovered in an absorption train, in ratio to the weight of iodide taken for conversion to hydroxide. The calculated weight of carbon dioxide being 14.44 percent of $(C_5H_5N.C_3H_7)_2CO_3$, there were obtained 14.99, 14.88, and 14.79 percent of carbon dioxide. In other trials the carbonation was incomplete, reaching only to 9.3, 9.47, and 10.1 percent.

In no case was the full quantity of pyridine isopropyl hydroxide obtained in weight of the dry residue, although the evaporation was conducted under different conditions, in vacuum, in a stream of dry air, and in a stream of dry hydrogen. In the case of the carbonate, the weight of the residue did not fall below the theoretical quantity. As hydroxide the weight of the residue always fell a good deal short of the full quantity.

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[27] This reverse ratio does not hold good between ethyl and isopropyl, in their pyridine iodo-products, the one being not the direct homologue, but the isomer of the homologue of the other. In 1882 Carnelly remarked of "isomeric compounds" as shown by many instances, that their melting points follow a rule the reverse of that accepted for their boiling points, namely that "those melt the highest in which there are the greatest number of side chains." (Phil. Mag. (5), 13, p. 126.)

[28] From a paper by A. B. Prescott and S. H. Baer, in the Jour. Am. Chem. Soc. for March, 1896, Vol. 18, p. 247.

[29] In work with quaternary nitrogen hydroxides, certain metals have been found to give distinctive reactions, likely to have analytical value. I hope to be able to report upon some of these ere long. A. B. P.

[30] From the paper last cited.

Pyridine isopropyl platinum chloride, perfect in proportions, was prepared from the black residue left on evaporation of the water solution of pyridine isopropyl hydroxide, by treatment in the usual manner. The black mass was dissolved in alcohol, treated with hydrochloric acid and platinum tetrachloride, and the crystalline precipitate fitted for analysis. Fine crystals were obtained, not melting below temperatures which cause decomposition.

	Calculated for $(C_5H_5N.C_3H_7Cl)_2PtCl_4$.	Found. I.	II.	III.
Platinum............	29.95	30.08	30.48	30.29
Chlorine..............	32.58	32.50	......	32.39
Ratio of Cl to Pt...	100:108	100:108	......	100:107

Pyridine isopropyl sulphate, the normal salt, was also prepared in fine crystals, by adding sulphuric acid to the hydroxide.

In various efforts to obtain the pure hydroxide in the solid state, crystalline or amorphous, vacuum desiccation, freezing temperatures, formation in absolute alcohol solution, and other agencies were successively tried, without success. Crystals were not obtained, and the residue was always dark colored. Evaporation in a stream of dry hydrogen yielded a residue of the same weight as that obtained by evaporation in a stream of dry air.

These results, so far, may be summarized as follows:

Pyridine isopropyl hydroxide remains in aqueous solution for a time without decomposition or loss in any way. The residue by evaporation of this solution, in air, or hydrogen, or vacuum, contains a considerable portion of the unchanged hydroxide, along with certain decomposition products not yet determined. The normal carbonate of this base, its normal sulphate, and its platinum chloride are easily prepared and preserved.

(To be continued.)

Betel Chewing.

By Dr. *Rodney H. True.*

Among the many means to which mankind turns for relief from the monotony and the drudgery of existence, few furnish solace to so many at so little expense to the mind and to the body as the chewing of the betel nut. If evidence were needed to show that it satisfies to a great degree some strong desire felt by a large part of the human race, the fact that betel chewing is a habit with about one-seventh of the population of the globe would be sufficiently convincing. That such a habit can have a history of over twenty centuries on one continent and that this is at present the most populous part of the earth, vouches for the absence of seriously harmful results. It enters largely into the ancient customs of the East and plays an important rôle in the lives of millions from early childhood to old age. It makes demands calling forth extensive industries and creates a considerable commerce. It gives hints to the physician and offers to science some of its most attractive fields for research.

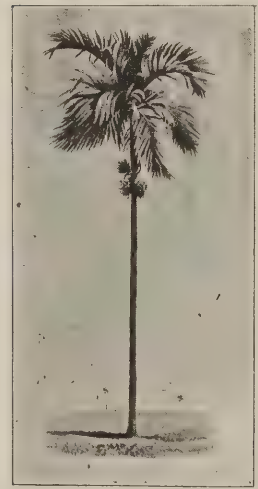

Fig. 1. Betel palm. (From Lewin's work l. c.)

The betel-chewing habit covers a wide geographical range. Beginning with the eastern boundary of Afghanistan on the west and the Himalaya mountains on the north, it rules all to the east and the south including the islands of the Pacific as far as Torres Straits (north of Australia) and as far east as 169° E. from Greenwich, including, therefore, a great part of the scattered groups of the Northern Pacific. Within these limits with but a few local exceptions, the natives of all races, colors and conditions, male and female, kings, princes, priests and paupers, daily and hourly, at work or at ease, standing or sitting, at home or with strangers, almost "from the cradle to the grave",—all are slaves to this habit.

Although causing no pronounced mental manifestations, exerting in general only a mild effect, this habit holds its devotees with a relentlessness almost without a parallel. The last test to which the Tagali maiden puts her lover to prove the ardor and the sincerity of his attachment is to require him to abstain from the betel. He may comply but it is only temporary since he is sure to return sooner or later to the old ways. On the island of Timor, when a chieftain dies, betel chewing is not indulged in for the seven days following. In India, after the death of a kinsman, deep sorrow is expressed by leaving this luxury untouched.

For the preparation of the betel roll as chewed, three very different articles are necessary: the nut of the betel palm, *Areca Catechu* L. (Fig. 1), the leaf of the betel pepper, *Piper betle* L., and powdered lime usually obtained from calcined mollusk shells. The pungent pepper leaf is daubed over with a little lime, a piece of the betel nut laid on it, the whole rolled up and thrust into the mouth. It is chewed until the mass is exhausted of its juices when the remainder is discarded and a new "chew" immediately prepared. It would be interesting to know what circumstances many centuries ago led some native experimenter to bring together these three so widely differing ingredients.

As before hinted, betel chewing has a long history, so long, indeed, that a host of customs and traditions have grown up about it.

One of the earliest records of betel chewing dates from 161 B. C. when, in a battle between the people of the Malabar region and those of another race, the Duttagamini, the Malabar warriors discovered on the lips of their enemies the blood-red color given by betel chewing and spread the rumor that their foes were wounded.

In the tenth century, Masûdi, the Arabian writer, describes betel chewing as a national habit in India. At later dates, numerous historians and travelers have described the habit in detail and have left us pictures which in all essentials represent the conditions now prevailing among the masses of the inhabitants of the betel-chewing world.

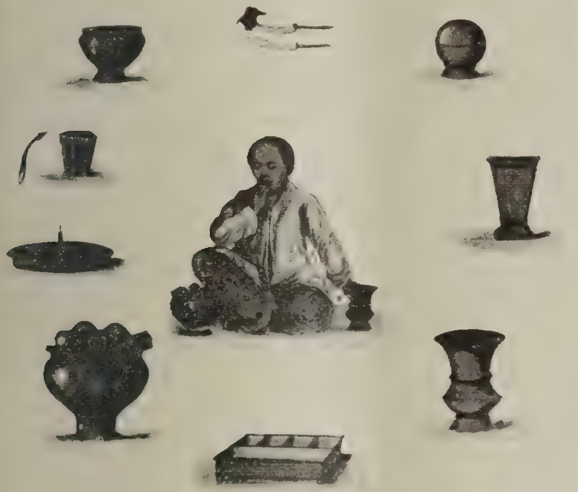

Fig. 2. Simple outfit for betel chewing. Javanese work. (From Tschirch: Indische Heil- und Nutzpflanzen. With permission of the publisher.)

As the cola nut in Africa and the kava kava root among the islanders of the Pacific, so within its realm, the betel furnishes the basis for many ceremonial usages. The betel, wherever used, is the sign of friendship, peace, courtesy and hospitality. At a mere meeting on the street or at the formal reception of ambassadors, on entering a hut or a palace, the betel is offered and gladly accepted. The failure to extend or to accept this courtesy is regarded as a great neglect or an insult. Under those conditions, friendly relations can not exist.

Marriages could hardly take place without this friendship-founding and friendship-sustaining article. In Siamese, the word for home is *kán măk*, meaning a dish containing betel. A betel roll prepared with spices and sent by a woman to a man is regarded in parts of India as a declaration of love.

At divorce ceremonies, the betel pepper figures conspicuously. The wife arraigns the husband before the authorities, pays a fixed sum and is free after she tears a betel leaf into two parts, one of which each of the principals consumes.

In parts of New Guinea, the daughters of the chiefs, when they become twelve or thirteen years old, remain at home for two or three years, after which their return to society is celebrated with much pomp. In the dance which takes place, the debutantes pass in and out among the dancers and make known their selection of a lover by handing him a betel nut.

In many places it is regarded as improper for a person of lower rank in speaking with a superior to cease chewing his betel roll. This probably is due to the fact that the betel sweetens the breath when chewed, and to cease might expose the person of higher degree to annoyance from the other's evil breath.

Although the symbol of friendship and good will, the tender of the betel may conceal deadly designs, since poison is easily administered by this method. Perhaps for this reason, it is customary in Sumatra to accept betel nut and pepper leaf but to use lime from one's own pouch. Danger is regarded as especially apt to lurk in the delicacies offered by the women.

On the Brahmaputra River, the natives measure distance by the number of betel rolls consumed in marching it. It is, of course, a time unit rather than one of distance. A similar custom is found among the coca chewers of Peru.

In religious ceremonies, the betel plays an important part. The ingredients, especially betel nuts, are frequently found as offerings laid on the altars for the gods. In Borneo, at the burial of the dead, Hatton saw the corpse in full dress, in a sitting posture, a cigarette in the mouth and near at hand a receptacle containing all of the ingredients necessary to betel chewing.

In New Guinea, the people believe that the future life is to be spent absolutely without work and care in the possession of endless quantities of betel nuts and day and night are to pass in the enjoyments of eating, dancing and chewing the betel. A fuller account of these and of many points of interest necessarily omitted here may be found in Dr. L. Lewin's admirable monograph entitled "Ueber Areca Catechu, Chavica betle und das Betelkauen."* This paper has been freely used in the preparation of this article.

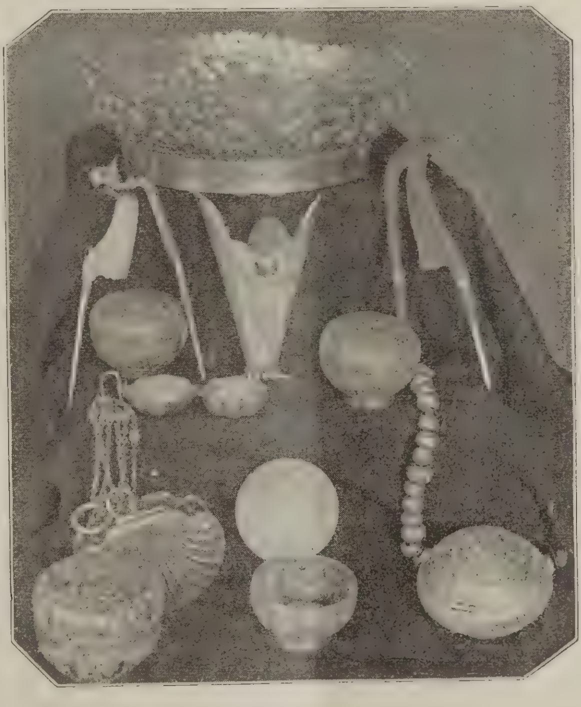

Fig. 3. Silver instruments used in betel chewing. Javanese work. (From Tschirch: Indische Heil- und Nutzpflanzen.)

Before passing on to the consideration of the action of the betel, we will notice more particularly the method of preparation of the roll and the instruments used.

Although in the essentials the method is with all races the same, many local variations are, however, found. The condition of the betel nut when consumed is not always the same. Sometimes the hard, dry, mature nut is chewed after it has been cut in pieces or powdered, again, the younger, soft nuts are chosen.

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* Ferdinand Enke, Stuttgart, 1889.

In Siam, instead of wrapping all three constituents together, a portion of the nut is put into the mouth and a piece of the pepper leaf covered with lime taken afterward. In the Philippine Islands, a somewhat more artistic method is found. The leaf after being covered with the lime is so folded as to form a flat band. The ends are then brought together forming a ring into which is fitted a round slice of the nut. A peculiar custom is found among the Malayans of Java and Borneo. The tip of the pepper leaf is always broken off and discarded before use. The reason for this procedure lies in an old legend. As a certain king almost at the point of death tossed on his couch in despair, a snake approached him bearing in its mouth a leaf of the betel pepper, tendering with the leaf the advice to try its efficacy. The king took the leaf, tore off the tip which the snake had held in its mouth and, after eating the leaf, enjoyed a quick recovery. In memory of this incident, the tip of the leaf is torn off even at the present day.

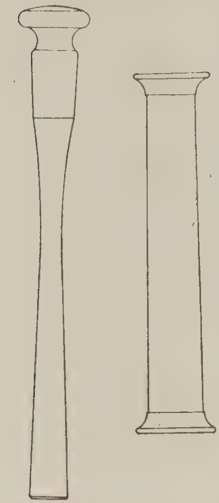

Fig. 4.

The betel nut is contained in a tough, fibrous husk from which it must be freed. To aid in this as well to reduce the dry nut to a proper state of division, instruments are necessary. For removing the husk, a somewhat sickle-shaped knife is used in India. The hard nuts are either broken by a blow from some heavy object or are split by means of some edged tool. Rude wooden mortars with pestles made from the shell of some gigantic ocean mollusk are used by natives of some regions. Since the nuts yield more readily to an edged instrument, strong knives of various patterns or heavy shears are used. The knife used in India for this purpose usually has a strong handle and a broad, bent blade.

In the pharmacognostical collection of the University of Wisconsin are a number of instruments, exhibited at the World's Fair, from Johore. Among the tools for husking the nuts are found three different forms. One has a short, broad, doubled-edged, bent blade. Others are not sharpened, being merely narrowed to a thick strong point. The third form is sharpened much after the manner of an ordinary chisel.

A brass instrument (Fig. 4) used for dividing the nut consists essentially of a cylinder having at the upper end an inside diameter of 18 mm. Gradually contracted downward until near the lower opening it is suddenly narrowed to a diameter of 13 mm. by a collar-like projection into the tube. The accompanying piece, likewise of brass but rather roughly filed into form, is chisel-like and plays into the tube as far as the sudden contraction near the lower end. Pieces of nut are dropped into the tube and chopped until the fragments fall out at the lower opening.

For cutting the nuts a kind of shears is employed in some regions. They consist of two arms, the lower of which merely supports the nut, the sharp upper blade dividing it. These shears are to be found from the simplest design to the most richly ornamented. In Fig. 2 is one of the simpler patterns; in Fig. 3 are more elaborate examples from Java, made of silver.

The betel chewer needs, of course, some sort of a receptacle for the various ingredients used. These receptacles are of the most various forms and workmanship. Some are woven from plant fibres, some are formed from gourds or cocoa-nut shells. The more permanent and ornamental receptacles are made of wood, sometimes most richly decorated with copper, silver or gold, with carving or with inlaid work of variously colored woods or mother-of-pearl. In Sumatra, the outfits of the wealthy are usually of silver, enriched with beaten work. In Java, a receptacle with compartments for the lime, betel nuts, tobacco and cardamoms is customary. These boxes are likewise ornamented in all degrees of richness. In Fig. 3 are shown some beaten silver receptacles of Javanese workmanship. In Fig. 5 is represented a compartment receptacle of a simpler sort from Johore.† It consists of two parts, the box proper, and a shallow till with places for the various ingredients. Figs. 2 and 3 shows still other forms of receptacles used by betel chewers. Special care must be taken with the lime supply. If more is desired than is demanded for immediate consumption it must be kept in air-tight receptacles in order that it may not lose its caustic property, and, therewith, its efficiency. Various devices for this purpose are made use of. All variations are found from the joints of bamboo tightly stoppered, used by the common people, to the richly carved ebony and tortoise shell articles of the rich.

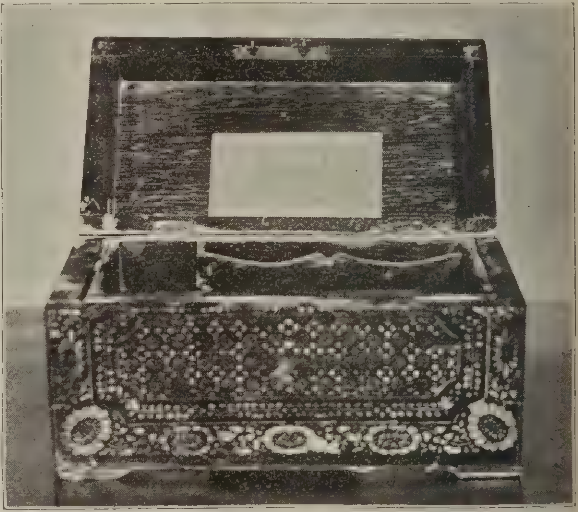

Fig. 5. Simple compartment receptacle.

Since each time a new betel roll is taken into the mouth the saliva is at first ejected, cuspidors may fairly enough be included in the list of necesities. As would be expected, this problem is easily solved by the poor. The higher classes have receptacles for this purpose made in various ornamental forms. In the royal court of Siam, a servant carries a golden spittoon about after the king. In Java, the princes have in their train two pages or young girls, one of whom carries about the copper cuspidor, the other the golden betel box.

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† This illustration is taken from a specimen in the pharmacognostical collection of the School of Pharmacy, Madison, Wis. It was exhibited at the World's Fair from Johore.

How does the betel habit affect its devotees? The effect following the first experiment with the betel as experienced by one not habituated is an unpleasant, burning sensation in the mouth and a feeling of constriction in the throat. As the chewing is repeated, however, the first disagreeable effects wear off, giving place to sensations so agreeable that even Europeans become devotees of the habit.

The quantity of saliva secreted is much increased and a blood-red color is imparted to it. In the Pharmacographia Indica, it is stated that the natives freely eject this red spittle "preferably over recently white-washed walls. The dry stains are often mistaken by the police for blood stains and pieces of plaster, leaves, and grass thus stained have frequently been forwarded to the chemical examiner for detection of blood."

The dark red color given to the gums and lips as well as the blackening of the teeth are among the most conspicuous results of betel chewing. White teeth are regarded by the Malayans as an imitation of apes and dogs while the brownish-black teeth of the betel chewer are much celebrated in Indian song. The agreeable perfume given to the breath is stated by the betel user to be one of the many reasons for his indulgence.

The physiological action depends on several factors. If one is unaccustomed to the practice or if green nuts are used, a temporary dizziness may follow. A poisonous variety of betel nut is occasionally found but this is regarded by the authors of the Pharmacographia Indica to be a form that has reverted to its former wild condition. In general, the betel is a mild, narcotic stimulant bringing about a feeling of general comfort, good humor and exhilaration. These effects, however, are not more marked than those experienced by the user of tobacco while enjoying his "Havana".

From the standpoint of toxiology, less is to be said against the betel habit than against either the tobacco or the alcohol habit. Lewin sums up the matter in these terms: "Those who take into consideration the conditions prevailing in the land of the betel chewer, come to the conclusion that, in view of the peculiar nature of the scanty nutrition of the Indians and the many climatic influences threatening the health, a moderate indulgence in betel chewing is advantageous."

The prophylactic and healthful influence of betel chewing has been recognized by the Dutch government by making provision for the distribution of the ingredients in hospitals and prisons. Whether the protection against fevers claimed by some for the betel habit is a reality or not must be here left undetermined.

Probably the greatest evil lies in the slavery to which this habit condemns its devotees and in the consequent danger of moral degeneration.

(To be continued.)

MONTHLY REVIEW.

Commercial Reports.

Essential Oils, Sicilian and Calabrian.

As can be seen from the subsequent statistical notes,* the export of these essential oils has amounted to 112,549 kilos during the year 1895, representing a value of £ 226,278. — being less than in the preceding year. This decrease may be explained by the fact that during the last six months of 1895 but a comparatively very small stock of oils was at disposal. The rise of prices was undoubtedly due to this scarcity of goods.

The prospect for the new crop of agrumen fruits was not favorable last fall. The extraordinary heat and drought could not but act detrimentally to the growth of the fruit and subsequent rains came too late to be of much use; long prevailing storms during the subsequent months did the rest. In consequence of these drawbacks the prices of all kinds of agrumen fruits experienced an upward tendency, which lasted until this March, when the first news of the Abyssinian calamity arrived. The effect of these reverses was so depressing that a decline in values resulted, which extended to all products and merchandise, including essential oils. This relapse, however, can only be a temporary one, as all trade relations in the districts which produce these oils are substantially normal.

Impressed as we are with the great importance of these essential oils for our branch of chemical industry, it has been our aim for years to restore the rather demoralized trade in these products to a sound basis. We believe we are justified in stating that our efforts in this direction have been rewarded with some success. The tests elaborated by us for the examination of the principal Italian essential oils have also proved a complete success. After the first irritation caused by this sweeping innovation had passed, the reliable method of controlling the quality of oils by our test more and more meets the appreciation and unqualified approval of and the adoption by, all who are interested in the production and the commerce of this commodity. The committees of various Chambers of Commerce in the larger cities of Lower Italy and of Sicily, consulted by the Government in regard to this important question, have also added their share to enlarge the impression that the prosperity of the oil producing districts and of this branch of the commerce of Italy depend to a large extent upon the introduction and the intelligent application of our tests for the identity and purity of these essential oils. Several analytical laboratories already have been or are about to be opened in Messina and in Reggio for testing these oils by our method and for certifying to their quality, in order to offer some reliable guarantee to the purchaser.

In order to elucidate some points as yet unsettled in this matter, a study of a number of details had still to be accomplished so as to attain to positive knowledge instead of relying upon vague conjecture. This investigation has been performed throughout the present campaign from the month of November until the end of February by Mr. Karl Fritzsche, eldest son of the senior partner of our firm.

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* See Report, p. 22.

Bergamot Oil. In the course of the present campaign it became evident that the fruit gave an unusually large yield, raising the expected return of but 50 percent of a fair medium yield by about 20 percent in addition. The transactions in bergamot oil have been rather dull, in consequence the high quotations with which the last season closed could not be maintained, and have declined by about 20 percent.

An advance of prices is hardly to be expected in view of the present disturbed political situation. It must be borne in mind also that the last winter has been a comparatively dry one with insufficient rains, so that the water courses in Calabria hardly contained half as much water as in ordinary years, and that the level of the underground water throughout Southern Italy has receded by about one half of a meter and that, furthermore, the bergamot trees, in all probability, will be exposed to a still greater drought during the coming summer than has been the case in 1895. And yet this species of citrus particularly needs for vigorous growth a regular and copious irrigation of the soil.

The stock of bergamot oil still remaining is estimated at 15,000 kilos. In point of quality the yield of the present season is inferior to that of last year, and at the close of the campaign but few lots of oil contained 40 percent or more of linalyl acetate.

We quote from Mr. Karl Fritzsche's report on his personal observations in regard to the methods of production the following particulars: —

The first two samples of oil of bergamot pressed from the latest crop were received on the 16th of November from Melito on the Southern coast of Calabria. The specimen No. 1 had a normal specific gravity and optical rotation and contained 33.3 percent of ester. No. 2 was equal to No. 1, except that it contained 34.6 percent of ester. All further supplies of samples of unsophisticated oils up to November 24th showed upon examination a percentage of ester ranging between 32 and 37. A sample of a so-called Nero oil obtained from the peels of unripe fruits, fallen from the trees, contained but 25 percent of ester.

With the fruits from four basketfulls gathered with much difficulty on November 30th, the following experiments were made with a view to ascertaining whether the amount of ester contained in bergamot oil stands in direct relation to the state of ripeness of the fruits. The fruits were carefully assorted, and the oil obtained separately from the green, unripe fruits on one machine and from the yellow, half-ripe ones on another. The constants of the two oils were found to be the following: —

Oil from green fruits: Ester 31.04 percent.
Optical rotation +17° at 18° C.
Oil from half-ripe fruits: Ester 33.24 percent.
Optical rotation +17°18′ at 18° C.

The estimation of the optical rotation could be accomplished in a 100 mm. tube, since both oils had a very light yellow color with a slight greenish tint.

The samples of oil supplied subsequently and until the 3d of December showed as much as 37.7 percent of ester. Until that date only a small part of the crop of fruits had been gathered, because incessant rains had flooded the orchards to such an extent that the ground was too wet to admit of a general plucking of fruits. The oil is expressed by machines only and this method works much more thoroughly than can be done by hand and is said to be in general use at present, securing a better yield of oil and saving much time. Handpressed oil, therefore, is scarcely to be had any more, and only in small quantities. The peel of bergamot fruits is thin and as tough as leather, while that of oranges and lemons is of a spongy consistence.

On the 18th of January the manufacture of bergamot oil was all but finished in Calabria, and in most orchards only a few days more were occupied in working up the remaining fruit. During the last weeks much rain and hail had fallen and the pressing of fruits had to be interrupted several times, because the yield of oil is much less in cooler weather. The oil obtained at a lower temperature (at the average +8° C.) is thick and turbid and can only be cleared by passing it through sponges or flannel filters. In warm and fair weather a much larger and a clearer yield is obtained.

The same conditions were met with in all the plantations visited, in Melito, Gallico, Arangea, Sbarre, Sancta Catarina, Catona etc. Only those fruits which are not globular but have the oblong shape of lemons are cut and pressed by hand, as is done with lemons, because the machines in use are adjusted to globular fruits only. From the remainder on the filters and from those defective fruits which are unfit even for being pressed by the hand, the oil is obtained by distillation. This oil, of course, is of inferior quality, yet large quantities of the same are exported to America. A specimen of this oil showed upon examination the exceedingly small amount of only 5.1 percent of ester.

Our observations made during the harvest of the fruit and the manufacture of the oil proved the gradual rise of the amount of ester to about 37 percent, which figure may hold good for the average amount contained in the oils of the present campaign. When this was finished, early in January, several samples of more lately pressed oils were found to contain as much as 40 percent and even more of linalyl acetate having at the same time a normal amount of residue upon evaporation. On visiting later on two plantations in Catona, oils from fully ripe fruits, selected and pressed in our presence, contained 44 percent of ester. The samples of oil, obtained at the commencement of the harvest season from unripe fallen fruits, contained 25 percent, from unripe, plucked fruits, 33–34 percent, from ripe fruits, 37 percent on the average, and from somewhat overripe fruits at the end of the season, as much as 44 percent of ester. This rise of the percentage of ester in proportion to the ripening of the fruits which yield the oil justifies the conclusion that the amount of ester found in oil of bergamot stands in an unmistakable relation to the degree of ripeness of the fruits and that it increases as they ripen.

Lemon Oil. According to reliable reports from Messina the trade in these fruits has been ruinous in the present season. The crop of early fruit (so-called Verdelli) has been a very small one in Sicily and has been bought up by American dealers at high prices. When the prospects for the winter crop showed a decrease of at least 30 percent as compared with the corresponding crop of last year, wild speculation set in and the fruit still green on the trees was sold in advance at excessive rates. In consequence of a long and hot summer the fruit ripened much sooner than had been expected, and immense quantities were shipped to North America, causing a rapid decline in prices, quite disastrous to Italian speculators and exporters. Since then the rates for fruits have recovered normal prices.

The rapid fluctuations of the rates in the fruit market of course reacted upon the oil prices. The producers of oil were restrained by the excessive prices and could not venture upon active work except at considerable risks. This explains the high quotations at first exacted for orders on credit, and not before the rapid decline of prices in America was there a chance for the manufacturer again to produce at fair rates. Considering the fact that the export of the new season entirely depends upon the new crop, it is not to be wondered at that considerable fluctuations of prices, ranging between M. 1.— and M. 1.50 per kilo, occurred. In consequence of the brisk demand for fresh oil, an accumulation of new stock was deferred, and not before the first part of March, and upon a slight decrease of the demand, did a somewhat larger supply take place. But this cannot but be a temporary one, since hardly more than about 25,000 kilos of oil are in stock, not enough to cover the demand for the next 7 or 8 months.

The yield of oil from fresh lemon peels is much less this year than the last, mainly in consequence of the persistent absence of rain during the four months preceding the harvest.

A close inspection of the orchards of all the lemon-producing districts of Southern Italy by our representative has enabled us to form a comprehensive estimate of the conditions prevailing and of the methods used, in this kind of cultivation. — The manufacture of lemon oil is in general carried on by three different methods:—

1. The **Spugna process;** this is the tradional operation with sponges, as described by Prof. Flückiger in his well known sketch: "Easter Vacation in the South." (Arch. d. Pharm. III, Vol. 27, p. 1065.)
2. The **Scorzetta process.** The fruits are cut into two halfs, the pulp is removed with a kind of spoon, and all parts of the peel are then pressed against a sponge by constantly turning it in the palm of the hand. This method has the advantage that the peels remain unbroken and retain their original appearance. After they have been deprived of the oil, they are salted and then exported under the name "Salato." The pulp also remains unimpaired so that it yields its full supply of lemon juice. After having passed twice through the pressers it is used for feeding cattle.
3. The **Machina process.** A number of contrivances have been tried for obtaining the essential oil of agrumi fruits by other less empirical and more economical methods. More recently a machine which has a rather complicated construction, but works very well, has come into use in Nizza di Sicilia, Mascali and Tremestieri. The product obtained by this process, however, is said to be less profitable, because both the quantity obtained and the quality of the oil leave much to be desired. It must remain to more extended experience to demonstrate, whether this machine will prove a success, or whether it will fall into oblivion like most of its predecessors.

The samples of "hand-made oils" and "machine oils" showed no constant difference in specific gravity or in optical rotation.

It may furthermore be stated that the machines specially, constructed and used in Calabria for pressing oil of bergamot, after the close of the bergamot season are occasionally also employed for pressing oil of lemon. The oil obtained in this way mostly shows, however, a greenish tint, resulting from its contact with the metal of the machine.

The present studies, extended also to a close observation of the methods for obtaining and preparing oil of lemon, were, among other aims, mainly directed towards ascertaining what influence, if any, the several localities exercised upon the optical rotation of the oil. Observations made with excellent instruments by Mr. Eduard Jacob already had adduced strong evidence that such variations between oils of lemon from various districts and localities exist. The recent personal investigation of our representative with oils pressed in his presence have fully borne out the corresponding previous observations of Mr. Jacob.

The oils derived from Barcellona on the Northern coast of Sicily and from the plains around Syracuse showed the highest optical rotation. It has been said that frequently oranges, somewhat damaged and unfit for sale, are mixed with lemons. This would raise the angle of optical rotation of oils obtained from such a mixture of fruits. In order to find out whether variations in the optical rotation of commercial lemon oils are due to natural or to such artificial causes, four specimens of oil from different plantations and freshly pressed in the presence of our representative were examined. Their optical rotation was from + 64° to 67° 30′ at 15° C.

The total result of our personal observations and the determination of optical rotation in the lemon oil producing districts was the following:

Sicily.

a) Provinces of Messina, Catania, Syracuse.

Oils from + 59° — + 61°: Messina and adjacent districts, Nizza di Sicilia.

Oils from + 61° — + 63°: Acireale, Santa Teresa di Riva, Scaletta, Sta. Lucia, Patti, S. Agata, S. Stefano.

Oils from + 63° — + 64°: Catania, Giarre, Giardini, Acireale, Lentini.

Oils from + 64° — + 67°: Barcellona, Siracusa,

b) Province of Palermo.

As regards the essential oils of this province, there are no records of observations that reach back several years. According to our notes and the statement of Dr. Theodore Leone, director of the research laboratory of the municipality of Palermo, the optical rotation of lemon oil produced in that province varies from + 59° to + 63°. Since, however, the latter figure is so high as to be rated as exceptional and has never yet been observed by us, these oils have been included on the map among those with an optical rotation from + 59° to + 61°.

[Semi-Annual Report of Schimmel & Co.]

Pharmaceutical Technique.

A New Aræometer.

This instrument consists of a glass vessel composed of two parts, A and B, separated by a glass wall C, the lower part being closed by a ground glass stopper. When B is filled with distilled water and the instrument is immersed in the same fluid, it should sink to the point marked 1.00 on the scale. To use the instrument, the lower bulb is filled with the liquid whose density we wish to determine, the stopper is inserted and the instrument immersed into distilled water, when the sp. gr. can be read off directly on the scale. One can read accurately to the third decimal place and approximate the fourth. Two classes of instruments are made, for liquids heavier and those lighter than water. [Jour. Phys., 4, p. 561.]

Chemistry.

Method for the Purification and Desulphuration of Mineral Oils.

In the course of his studies of the chemistry of brown coal tar, F. Heusler (Berichte, 25, p. 1665) has found that the sulphur compounds contained therein belong to the thiophene series. In order to effect, if possible, a desulphuration of this tar, thiophene was subjected to an investigation which led to the result that this compound under the influence of aluminium chloride is changed, by the partial splitting off of sulphur, to a sulphur-containing resin. As it has been found that the unsaturated compounds contained in the tar oils react quantitatively upon each other in the presence of aluminium chloride with the formation of high boiling lubricating oils and as analogous results are obtained by treating shale and petroleum oils in the same manner, we have here a method for producing illuminating oils free from unsaturated substances as well as sulphur compounds from these crude products. In this process artificial lubricating oils free from paraffin are obtained as side products; the quantity of which corresponds to the amount of unsaturated compounds contained in the mineral oil employed.

The action of the aluminium chloride upon the mineral oils takes place in such a manner that the unsaturated substances and sulphur-containing bodies react upon each other. Only when an excess of aluminium chloride is present do the reactions already known, especially that of Friedel and Craft, who first observed the splitting off of gaseous hydrocarbons from the paraffin oils, take place. A characteristic of the process under consideration is that the action of the aluminium is a fractional one; the further addition of aluminium chloride is stopped when the quantity of this compound brought into reaction is just sufficient for the desulphuration of the oil. In this there is at the same time a considerable technical advantage. For instance in the purification of mineral oils there is considerable saving of aluminium chloride, and on the other hand a secondary decomposition of the purified oil is prevented.

The quantity of aluminium chloride required is the greater the richer the mineral oil is in unsaturated substances and sulphur compounds. It varies from 0.5 to 5.0 percent.

The carrying out of the process differs in details with the different mineral oils or tar distillater. The following cases are to serve only as examples.

I. Desulphuration of Ohio Oils.

Ohio oil is fractionated so that the illuminating oil fraction contains but small quantities of substances boiling below 150°. 100 parts of this crude illuminating oil are heated to boiling in an apparatus provided with a reflex condenser and stirring apparatus, and 0.8 parts of aluminium chloride gradually added. Hydrochloric acid and a considerable quantity of sulphuretted hydrogen escape. After the evolution of gas has ceased it is allowed to cool, and the oil separated from the aluminium-containing resin that has formed. The oil is first washed with water and then with caustic soda solution and distilled after the addition of a small quantity of lime.

II. Brown Coal and Shale Tar Oils.

The fractions of brown coal or shale tar are treated with 3 to 4 percent of aluminium chloride in the manner described. After cooling, the separated oils are washed with water and then either distilled with water-vapor or the unchanged saturated hydrocarbons separated from the lubricating oils that remain in the residue by fractional distillation. The lubricating oils are either used directly or after distillation in vacuum. [G. I. P.]

A Review of some Improvements in Chemical Industry, by Frank H. Thorp.

Heavy Chemical Manufactures.

Sulphur.

Sicily continues to furnish the larger part of the world's supply of sulphur, although many of the mines are now idle. The industry has suffered a period of great depression since 1890, and the price in 1895 had fallen to about $16.00 per ton for seconds and $15.00 for thirds. A few operators have attempted to introduce more modern appliances for mining, the better to meet low prices, but in most cases this has only been done after a struggle against native prejudice, even resulting in riots at the mines.

In the methods of extracting sulphur from the gangue little advance has been made since the papers of Professors Mallet[1] and Newbury[2] were published. The "calcerone" is most generally employed, though melting out the sulphur by the use of solutions of calcium chloride[3] is used to some extent. Extraction by means of carbon disulphide has made little progress.

Japanese sulphur has become a considerable competitor with the Sicilian, and in these mines are found many modern improvements and economical working. Late statistics show that 84 mines were in operation in 1894. A new sulphur deposit of probable future importance is being developed on the island of Tanna, New Hebrides. A rich ore, with cheap labor and fuel at hand may make this even a more formidable rival of Sicily.

Our domestic production has fallen until it scarcely deserves notice, but little more than 400 tons being produced in 1894. An innovation recently introduced in the Nevada mines, is a plant for hydraulic mining to remove the overlaying surface earth. The method of extraction employed in this country is the Dubois[4] process of distillation with steam in rotary retorts. The deposits of Louisiana and Texas have not been developed.

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[1] J. W. Mallet: Am. Chem. Journal, 1, p. 273.
[2] S. B. Newbury: Ibid, 11, p. 124.
[3] Vincent: Bull. Soc. Chim., 40, p. 528.

Of the several recovery processes for sulphur from the tank waste of the Leblanc soda industry, only the Chance-Klaus[5] method has proved practical on a large scale. This can be so managed that a large part of the product is obtained as "flowers of sulphur," which finds a ready sale because of its purity and attractive appearance. But the process has not apparently met the original expectations of its promoters, for in 1894 England imported 20,100 tons of sulphur besides their imports of pyrites. Apparently about 12,000 or 15,000 tons are now recovered annually, though exact figures have not been obtainable. In 1893 the United States imported about 10,000 tons of sulphur from Great Britain, of which a considerable part was probably recovered sulphur.

The manufacture of wood-pulp by the sulphite process has stimulated the demand for sulphur within the past few years in this country.

Pyrites.

The use of pyrites for sulphuric acid is constantly increasing, but owing to the very low price of brimstone for the past two years, a few acid makers who had not destroyed their old brimstone burners, returned to the use of sulphur. Mr. K. F. Stahl[6] presented the relative merits of brimstone and pyrites, in a paper published about three years ago, and figured a difference of three cents per ton of 50°Bé acid, in favor of brimstone; but he based his estimate on pyrites at $6.00 per long ton. E. W. Parker[7] shows, however, that the actual cost of pyrites in 1893, was less than $3.50 per long ton and pyrites acid of 50°Bé really cost $5.00 per ton, against $6.25 for brimstone acid. Since our native pyrites are nearly free from arsenic and contain but little copper, there appears to be no good reason for the continued use of brimstone, except for a special acid free from all traces of arsenic, copper or zinc. Even at the present price of brimstone, the other items remaining the same, a decided advantage remains with the pyrites acid.

Improvements in the business have resulted in the production from pyrites of an iron oxide containing 1 to 2 percent of sulphur. This now finds a somewhat restricted use in the arts and as an iron ore. Residues from Spanish pyrites containing copper are of course valuable ores for that metal.

Sulphuric Acid.

The chief advances in sulphuric acid making have been in the improvement of details rather than in radical changes of apparatus or system. Mechanical furnaces have been introduced in some works recently, and generally give good results. They seem to be particularly good for burning "fines," since they allow no excessive introduction of air during raking. Muffle furnaces of the Spence type of mechanical burners have proved successful for roasting zinc blende, the muffle being heated by generator gas. The waste heat of the fire is utilized to heat the air by which the blende is oxidized. The ore is charged through a hopper into the top shelf of the burner and raked down by mechanical rakes from one shelf to the next. Some recent kilns of this kind will roast about 42 tons of ore carrying 28½ percent sulphur, in twenty-four hours, not more than 1 percent sulphur being left in the roasted ore. For making sulphuric acid, the gases from blende-roasting are treated in much the same way as those from pyrites. Since the amount of sulphur in blende is not sufficient to support the combustion, the roasting is accomplished by the aid of external application of heat to the muffles.

The Lunge-Rohrmann perforated plates are generally considered unsuitable for use in the Glover tower (though the inventors did not recommend them for this purpose),[8] because the high temperature would cause them to crack and impure gases might clog the openings. But placed in towers between the chambers they undoubtedly are effective. Their great cost, together with the fact that they offer considerable resistance to the movement of the gases, hinder their more general use. The "pipe columns" of Gilchrist[9] and Hacker have been introduced in several acid works in this country but in one case, at least, proved a failure. In other cases, however, under different conditions they seem to give very satisfactory results. Their chief advantage appears to be a more thorough mixing of the gases as they pass from one chamber to the next. The cause of the one failure above mentioned is attributed to improper placing of the towers, on the theory that their chief function is to cool the gases.

In some acid works, instead of steam jets in the outlet pipes, fans are used to assist in the movement of the gases, and give better results.

The more modern form of Glover tower has a steel frame and is lined with acid-resisting brick on tile. Quartz is still in favor as packing for these towers.

The general trend of improvement appears to be in the direction of smaller chambers and increased tower capacity. One of the latest ideas of this kind is embodied in Barbier's Tower System,[10] in which the lead chambers are entirely abolished and a system of towers substituted for making the acid. The scheme has hardly advanced beyond the experimental stage as yet, but gives promise of future importance. In this system the gases from sulphur or pyrites burners are led into a series of towers, five or six in number, connected by flues from the top of one tower to the bottom of the one adjacent. Beneath each tower is a pan for collecting the acid formed. These pans are set *en cascade*, so that the overflow is by gravity from one to the next, and all are set over a flue leading from a fire grate at the lower end of the series; or they may be heated by the sulphur dioxide gas on its way from the burners to the towers. The towers are filled with perforated pottery vessels of acid-resisting material, thus affording a large surface exposure. A sprinkler at the top of each tower supplies the dilute nitric acid needed. The last tower of the series is a Gay Lussac for absorbing the nitrogen oxides. As it is formed, the acid collects in the pans beneath the towers and flows from one to the next, always approaching the fire and becoming more concentrated in each pan, the denitration being accomplished at the same time. The water vapor and nitrogen gases pass off from the pans and immediately back into the towers. The final concentrating pan is set directly over the fire and not under any tower, and in it the acid reaches a gravity of about 60° Bé.

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[4] J. Soc. Chem. Ind., 1887, pp. 439, 442; 1889, p. 696.
[5] J. Soc. Chem. Ind., 1888, p. 163.
[6] J. Anal. Appl. Chem., 1892, p. 690.
[7] Mineral Resources of U. S., 1893, p. 745.
[8] J. Soc. Chem. Ind-, 1893, p. 232.
[9] J. Soc. Chem. Ind., 1894, p. 1142.
[10] P. de Boissieu: Bull. Soc. Chem., 11, p. 726. U. S. Patent No. 535882, March 19, 1895.

The advantages claimed for this system are, a more concentrated pan acid, free from nitrogen; larger yield per cubic meter of tower space compared with the cubic capacity of chambers; adaptability to use in both warm and cold climates, the temperature in the tower being high, (about 90° C); the cost of construction not exceeding one-half that for a chamber plant of the same daily output; and a much smaller ground area to be occupied.

While this particular apparatus may not prove entirely successful,[11] there seems no doubt that the tower system is in many ways superior to the chamber process and will probably be much developed in the near future.

Among improvements in the methods of concentration of the acid is to be noted that much of this is now done in the Glover tower, which is so constructed and managed that acid of 62° to 66° Bé may be obtained directly. In some cases two towers are in series, the one next the chambers being the denitrating tower and part of the acid from it is sent through the tower next the burners, by which the acid is concentrated up to 64° or 66° Bé, the steam passing along with the sulphur gases into the denitrating tower.

Kessler's[12] apparatus, in more or less modified form, is also being introduced for the concentration of acid. This is a continuous surface heating system used in connection with platinum or iron stills which are fired with generator gas or oil, and the waste fire gases passed over the surface of the acid contained in lead-lined iron tanks.

Cast iron stills are replacing platinum to a great extent, the acid being concentrated to about 64° Bé in the Glover tower and finished in the iron still. The results are very satisfactory and the life of a still is from two to six months.

Gold-lined platinum stills are used to some extent, but their great cost acts as a bar to a more extended application.

Another new idea is the abolition of the "acid-egg," a system of air-lifts similar to those used for raising water from artesian wells, being substituted.

[Am. Chem. Journ., 18, p. 420.]

Botany and Pharmacognosy.

Adulteration of Saffron.

César Chicote has found in saffron the petals of a Spanish species of *Dianthus* cut up and colored with acid fuchsin with the help of glucose. Since the bluish-red color is easily removed by water, the adulteration is easily detected.

[Pharm. Ztg., 41, p. 293; from Journ. de Pharm. et de Chim., 1896, p. 117.]

Poisoning by Cypripedium.

Prof. D. T. MacDougal reports that *Cypripedium pubescens* and *C. parviflorum* are capable of producing symptoms of poisoning in many people by simple contact of the foliage with the unprotected skin. The source of this action is located in the secretion found in the tips of abundant glandular hairs. The poisonous activity increases with the development of the plant, being greatest after the flowering period.

[Minn. Bot. Studies, Bull. 9, Part 7.]

Cultivation of the Date Palm.

Reports concerning the cultivation of the date palm (*Phoenix dactylifera*) in Australia show that in 1894–95, an eight year old tree in South Australia yielded 50 pounds of dates of good quality. In the West Indies trees four and a half years old were found in fruit. In March, 1891, at the botanical station, Copse Cross, near English Harbor, a quantity of date seed was planted and the seedlings were distributed to different stations. At Copse Cross, 86 date palms now exist. If the quality of the fruit is good, shipment to the United States will doubtless take place.

[Pharm. Ztg., 41, p. 258.]

Rhamnus Frangula L. in America.

Mr. W. M. Van Sickle of West New York, N. J., reports the discovery of specimens of this interesting European buckthorn in the swamp at Secaucus, some distance from the present known locality for this plant at New Durham. The problem concerning its mode of introduction into the United States is a difficult one to solve. The fact that Michaux's *Arboretum* was situated on the site of the present New Durham swamp indicates that it may have been originally planted there and thriving under favorable circumstances, spread rapidly and in time developed trees of the size now found. It was long ago reported from Flushing, Long Island, that this station is now apparently obliterated.

[Charles L. Pollard in Bot. Gaz., XXI (1896), 235.]

Opium Production in Macedonia and Persia.

According to consular reports from Salonica the cultivation of *Papaver somniferum* in Macedonia is increasing rapidly. In 1893, 37,500 lbs. of opium were exported from Salonica, in 1894, 157,000 lbs. Most of this opium goes to America, considerable to London, little to Germany and France.

In Persia in 1894, the district Ispahan produced 390,000 lbs., the exported opium (1600 chests) being estimated at a value of $625,000. The entire amount went to China. From Yezd, 530 boxes of 130 lbs. weight valued at $159,000 were exported. Opium from this region is most highly prized in Persia and during the poor yields of the last few years, opium from Ispahan and elsewhere has been worked over into the form characteristic for Yezd opium and sold as such.

The highest morphine content of Persian opium examined upon the spot was 12 percent.

[Pharm. Ztg., 41, p. 294.]

Quinine from Renewed Bark.

The report from the cinchona plantations of Java for the third quarter of 1895 gives tables which tend to show that the quinine-content even after several years does not reach that of the primary barks. From trees which yielded in 1891 a primary bark containing 8 to 11 percent, in 1895, in no case did the yield exceed three-fourths of the former figure. The highest yield was 7.13 percent against 10.71 percent. Even after 12 years of rest, in only 30 percent of the trees was an increase found, in 70 percent of the trees the quinine yield was one or two percent lower than in the primary bark.

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[11] Unsatisfactory results with this apparatus are reported from Italy. J. Soc. Chem. Ind., 1895, p. 698.

[12] J. Soc. Chem. Ind., 1892, p. 434, and 1895, p. 156.

[Pharm. Ztg., 41, p. 293; from Nederl. Tijdschr. voor Pharm., 8, p. 48.]

Alkaloids from Australian Solanaceæ.

According to the Lancet, Joseph Leuterer of Brisbane has investigated various Australian *Solanaceæ* with regard to their pupil-dilating alkaloids. Fresh, young leaves of *Duboisia myoporoides* contain scopolamine whereas the old leaves and stems contain hyoscyamine. The leaves are the richest in alkaloid constituents when the flowers are developing, containing 0.3 percent of the alkaloid; in winter, they fall off to one-tenth of that amount. Dry leaves contain 0.97 percent of alkaloid and are, therefore, stronger than belladonna leaves. Still richer is *Duboisia Leichardii*, F. v. Muell, which, according to Leuterer contains mainly scopolamine.

This is not in accord with results obtained by Jahns of Goettingen from material sent by Baron von Mueller. According to Jahns, this third *Duboisia* species contains only hyoscyamine. The alkaloid content, however, agrees, a fine specimen yielding two percent. From this, *Duboisia Leichardii* would seem to furnish excellent material for the preparation of hyoscyamine.

In the leaves of tropical species of thornapple cultivated in Queensland, *Datura arborea* and *D. Knightii*, the author found less alkaloid and this consisted of two-thirds hyoscyamine and one-third atropine.

[Pharm. Ztg., 41, p. 258.]

Indian Drink Plants.

In a recent article on the drink plants of the North American Indians, Dr. V. Havard brings out many interesting facts.

At the time of Columbus, the Indians north of Mexico had not learned to prepare alcoholic drinks. In Mexico, from time immemorial, the preparation of the national beverage, pulque, by allowing the sap of the *Agave Americana* to ferment, seems to have been practiced. The mescal, *vino mescal*, a drink obtained by distilling the heads of the *Agave* after previously baking, pounding and fermenting them, was unknown to the Aztecs who, like the other American aborigines, were ignorant of the art of distillation until it was introduced from Europe. They made a sort of mescal beer by merely omitting the distillation.

Maize furnished another stimulant. Even before the days of Columbus, corn was the principal crop of the agricultural Indians north of the Rio Grande, and it seems remarkable that, as the culture of corn spread to the northward from Mexico, the primitive art of making corn beer should never have accompanied it. It is also interesting that the roving, robbing Apaches, seldom planting corn themselves, should have been for several generations back extremely fond of tizwin, another alcoholic drink prepared from corn, while their agricultural neighbors with plenty of maize seem to have abstained. According to the best information, it is probable that the Apaches learned from Mexican Indians to prepare tizwin about the beginning of this century.

The fruit of the giant cactus, (*Cereus giganteus* Englem.) furnishes a clear light-brown syrup yielding a fermented liquor having the taste and smell of sour beer. Upon this liquor certain tribes get drunk once a year, continuing the revelry for a week or two at a time. As a matter of protection from each other and from hostile tribes, they take turns, one-third drinking, the others keeping guard.

The fruit of several species of *Opuntia*, prickly pear, yield an intoxicating drink called colonche. The yucca, mesquite, and other plants furnish still other drinks.

Several plants yield intoxicating principles not alcoholic.

A small, napiform, tuberculous cactus, (*Anhalonium Engelmanni* Lem.) two or three inches high is cut into slices by the Mexicans, dried and kept as a remedy for fever. It is used principally, however, as an intoxicant. A closely related genus contains a small cactus (*Lophophora Williamsii Lewinii* Coult.) covered above with hairy tufts, that is used similarly. The so-called "mescal buttons" concerning the effects of which investigators differ, also are intoxicating when chewed.

A beverage prepared by the Indians of Lower California from the leaves and seeds of *Datura* species first intoxicates then stupefies.

The red bean-like seed of *Sophora secundiflora* Engelm. contains an alkaloid, sophorine, which acts as a strong irritant-narcotic poison. Half a seed is said to produce a delirious exhilaration followed by a sleep lasting for two or three days. A whole seed is said to be fatal to a man.

Ilex vomitoriá Aiton, a handsome evergreen shrub near the coast southward from Virginia and along the Gulf, furnishes an infusion containing *caffeine*. Venable finds from 0.27 p. c. to 0.32 p. c. of this alkaloid in the leaves. This, with an added emetic, was formerly drunk by the Indians to cleanse themselves during certain religious festivals.

A number of palatable drinks designed merely to quench the thirst are mentioned. They are in most cases either the sweet sap from trees or have fruits as a basis. [Bull. Torrey Bot. Club, 23, p. 33.]

Practical Pharmacy.

Preparation of Ergotin (Yvon's).

500 g. of freshly powdered ergot are mixed with 1.5 g. of tartaric acid and 50 g. animal charcoal, then moistened with 50 g. of cherry-laurel water and sufficient more distilled water, and packed into a percolator. After macerating for 12 hours, it is extracted with about 3 litres of water to which a little cherry-laurel water has been added. The percolate is concentrated to a syrupy consistency on the water-bath, with constant stirring, and then mixed with 2.5 g. of chalk. After 12 hours, a small quantity of the mixture is dried to determine the water content, and enough 90° alcohol added to make a spirit of 75°. This is best done according to the formula $N = \frac{79.E}{21}$, where N is the

amount of alcohol to be added, and E the amount of water contained in the mixture. After stirring and macerating for 80 hours, the liquid is filtered, concentrated on the water-bath and 0.75 g. salicylic acid and enough cherry-laurel water added to make 500 g.

Ergotin so prepared is almost colorless and can be kept indefinitely. [Pharm. Centralhalle, 37, p. 248; from Journ. de Pharm.]

Substitution of Selenium for Sulphur.

Dumont recommends selenium to replace sulphur in ointments, claiming greater therapeutic value for the former. He prescribes: Selenium praecip. 2.0 g., Unguentum Paraffini 30.0 g.; misce.

[Pharm. Post, 28, p. 470; from l'Union Pharm.]

Eucasin.

Eucasin is a new compound made by passing ammonia gas over casein. It comes into the market as a fine powder, completely soluble in warm water. According to Salkowski, it has greater nutritive qualities than somatose, being absorbed to a much greater extent. While with other albuminous foods nuclein is also introduced, this is not the case with casein or eucasin. Since nuclein bodies especially favor the formation of uric acid, they should be avoided in rheumatism and similar diseases, and eucasin can find an application as a substitute for albuminous substances in such cases. It is administered in soups, bouillon, chocolate, etc.

[Zeitsch. des allg. österr. Apoth. Ver., from Deutsche med. Wochenschr.]

Erithrolum tetranitricum and Kresochine.

The tetranitric ester of the tetratomic alcohol erythrol is a new preparation recommended to replace nitroglycerin in diseases of the heart. Kresochine, a new antiseptic, has recently been put upon the market by Fr. Fritsche & Co. of Hamburg for the disinfection of instruments and for general disinfection on a large scale. According to the manufacturers, it consists of neutral tricresolsulphonate of quinoline and a loose combination of quinoline with tricresol. It contains 33% of quinoline and 17% of tricresol. Kresochine differs from the well-known soapcresol solutions in containing no alkalies, but containing the cresols and quinoline in a condition in which these substances can produce their highest bactericidal action. The preparation does not render the hands slippery, is neither caustic nor irritating, and dissolves to the extent of 5% in any water even when containing much lime. [Pharm. Ztg., 41, p. 304.]

Concerning Ostensibly "Non-poisonous" White-lead.

Under the name of "The new English non-poisonous white-lead," a firm in Glascow is selling a lead paint composed mainly of lead sulphate. That lead sulphate on account of its poor solubility is entirely non-poisonous has often been doubted, and recent experiments performed by Dr. H. Kionka of Breslau go to prove the opposite.

A preparation containing 97.64% of lead sulphate with some carbonate and other impurities, when administered to rabbits in doses of 10 g., proved fatal in 16–18 hours, while 2 g. daily caused death in 8 days. 10 g. fed a dog, caused vomiting and after daily repetitions of the dose, death ensued on the seventh day. This would show that the so-called "non-poisonous" white-lead acts as a local irritant and is absorbed by the mucous membrane of the stomach and of the intestines, causing symptoms of lead-poisoning.

[Apoth. Ztg., 11, 322; from Deutsche med. Wochenschr., 18, 281.]

Greek Letters in Prescription-writing.

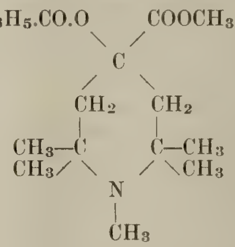
A new style of prescription-writing is recommended by Dr. Loeffler in the Aerzt. Korrespondenzblatt. The author calls attention to the fact that in prescribing the newer remedies, the names of most of which are familiar to the general public, the customary writing of prescriptions in the Latin language does not protect the physician from inconvenient criticisms of laymen, so that it often would seem advisable to adopt a style less intelligible to most persons. To this end Dr. Loeffler has used for some time the Greek alphabet though still retaining the Latin nomenclature, and in all the apothecary shops of Dresden his prescriptions are readily understood. E. g., he prescribes antipyrine as follows:

℞
ἀντιπυριν 1,0
Δ. ταλ. Δωσ. Νω. X.
Σ. Daily etc. etc.

[Pharm. Zgt., 41, p. 243.]

A New Local Anaesthetic.

Eucaïn, the methyl-ester of a benzoylated γ-Oxypiperidinecarbonic acid has been introduced as a new local anaesthetic and substitute for cocaine by the Chem. Fabrik auf Actien (vorm. E. Schering) of Berlin. It is cheaper than cocaine and harmless in medicinal doses. The name eucaïn has been adopted to take the place of the complicated chemical name, benzoylmethyltetramethyl-γ-oxypiyeridincarbonicacidmethylester. Its constitution is represented by the formula:



The eucaïn base, like that of cocaine is almost insoluble in water and therefore useless therapeutically, but like cocaine it forms a readily soluble hydrochloric acid salt.

Eucaïnum-hydrochloricum, $C_{19}H_{27}NO_4.HCl$. The hydrochloric acid salt of eucaïn is preferable to that of cocaine because its aqueous solutions can be boiled and therefore sterilized without decomposition, while cocaine by boiling is split up into benzoylecgonin and methylalcohol, thus losing its properties of a local anaesthetic, and becoming irritating to mucous membranes. Reichert used eucaïn in deseases of the throat and nose, and besides proving its qualities as a strong local anaesthetic, showed it to be without any action on the heart. Schleich showed that in solutions of 1–5% it was a perfect substitute for cocaine in anaesthesia of mucous membranes. Warnekros and Kiesel have employed eucaïn in dentistry (teeth-extraction, etc.), and found that while the heart was unaffected, the anaesthesia lasted longer and extended farther than with cocaine, and that solutions prepared with sterilized water could be kept indefinitely. In all their experiments they used a solution of 1 p. of the hydrochloric acid salt in 6½ p. of water. [Pharm. Post, 29, 192.]

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—Eucaine, a new local anæsthetic. By H. Kiesel, Dentist. From Zahnärztliche Rundschau. pp. 4.

—Vorotropin, a superior diuretic, uric acid solvent and remedy for calculous disease. By Dr. J. A. Flexner. From Am. Practitioner and News. pp. 4.

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Reviews.

Handwörterbuch der Pharmacie. Praktisches Handbuch für Apotheker, Aerzte, Drogisten und Fabrikanten. Unter Mitwirkung einer Anzahl Fachmänner herausgegeben von A. Brestowski. Verlag von Wilhelm Braumüller in Wien und Leipzig. 24. (Schlusslieferung). 1896.

With the 24th fasicle this comprehensive and exceedingly useful encyclopædia of pharmacy and the more closely connected medical and hygienic branches has been brought to its conclusion. This elaborate work has been in course of publication since about four years; the first volume was completed in the fall of 1893 and was reviewed in the December number of the Rundschau (p. 296) of that year. With the second, concluding volume, embracing 943 pages, a reference work of great value and of a most comprehensive nature is now placed before pharmacists, druggists and manufacturers, which will prove of paramount practical usefulness. In the daily practice and for ready reference this encyclopædia will almost replace a pharmaceutical library. Its use is greatly facilited by a comprehensive alphabetical index; its make-up is an elegant and substantial one; and the work is a credit to its authors as well as to its publishers.

Fr. H.

Prantl's Lehrbuch der Botanik, herausgegeben und neu bearbeitet von Dr. Ferd. Pax, Prof. der Botanik und Director des bot. Gartens in Breslau. One Vol., pp. 406, with 387 illustrations. 10th, enlarged Edition. Publ. by W. Engelmann, Leipzig. 1896.

The ninth edition of this work has been briefly reviewed and recommended on page 175, Vol. XII of this Journal. Although not yet translated and published in the English language, this text-book of botany is well deserving the consideration of students of botany as well as of pharmacy. Written and re-modelled by two succeeding eminent German professors of Botany and having passed through ten editions, the book has been perfected both in text and in illustrations. Compared with the preceding 9th edition, the present one has been augmented by 41 pages and 32 cuts.

The book is divided into the following general sections: Morphology (pp. 1—38), anatomy (pp. 38—101), physiology (pp. 101—148), systematic description of the families. This descriptive survey is arranged in accordance with the following systematic order: myxomiceta, thallophyta, archigoniata, phanerogama. A comprehensive index facilitates the use of the book. Print and paper correspond to the excellence of the work and its make-up.

Fr. H.

Dictionnaire de Physiologie. Par Charles Richet, Professeur de Physiologie à la Faculté de Médicine de Paris. Tome premier A-B, 3e fiscicule, pp. 673—1046, avec gravures dans le texte. Ancienne Librairie Germer Bailière et Cie., Félix Alcan, éditeur. Paris. 1895. Fr. 8.50.

With fascicle three, volume one of this monumental work is completed and the reader can more fully realize what its scope and character is to be. The table of contents covers the letter A: one hundred and eighty-six articles written by more than thirty writers. Many of these articles are veritable monographs, closely related subjects sometimes being treated by several experts. Not only does this dictionary occupy a unique position in physiological literature, but in general scope and character as well as in the working out of details of individual articles it compares favorably with similar scientific works.

Fascicle three contains but few chemical subjects: arsenic, asparagine, atropine, nitrogen, etc., but these will prove of exceeding interest. The chemist does not expect to go to a dictionary of physiology for chemical information pure and simple. Under arsenic, for example, he will find a number of pages of exceeding interest on acute and chronic intoxication, the action of arsenic on the blood, etc., the theory of its action, the arsenic habit in Steiermark and Tirol. Under nitrogen and derivatives the most important subject from the physiological standpoint is that treating of the assimilation of nitrogen by plants, to which subject over forty pages are devoted. On the physical side the subject of hearing is treated at length, not less than ninety pages with numerous illustrations in the text being accorded this important subject. To the biologist the article on the assimilation of nitrogen by plants as well as that on bacteria, which is only begun in vol. one, are of special interest. Other articles treated more or less in detail are those on arteries, asphyxiation, assimilation, astigmatism, attenuation. Fascicle three, like the two that have preceeded it, is replete with interest.

E. K.

Proceedings of the American Pharmaceutical Association at the forty-third annual meeting, held at Denver, Colorado, August, 1895. Baltimore: Published by the Am. Pharm. Ass'n. One vol. pp. XXIX, 1222. 1895.

The National Formulary of Unofficial Preparations. Revised edition. By authority of the Am. Pharm. Ass'n. pp. XIII, 195. 1896.

Little can be said about this formidable volume that has not already been repeatedly stated in connection with earlier volumes of this annual. That like other volumes of its kind it has not been quick in making its appearance, is nothing new. Possibly few of those who have complained realize what it means to edit almost five hundred pages of association proceedings and papers, and to superintend the printing of a volume of over 1450 pages. Inasmuch as the proceedings of the Denver meetings have been reported in more or less detail by the pharmaceutical press and since the papers have been printed and even reprinted in a large number of journals, one half of the volume was largely familiar to the pharmaceutical public before the publication of the Proceedings. The Report on the Progress of Pharmacy, which virtually is the American Yearbook or Jahresbericht is new and of particular interest.

Yearly an enormous amount of work and considerable money is spent on this report. Whether a report that will satisfy a large majority of the members of the Am. Pharm. Ass'n., will ever be written is very doubtful. For one person to write such a report well is a herculean and ungrateful task. Without commenting on the report for 1895 in particular, the writer would rather emphasize what he stated on the subject of such reports in general in connection with the Jahresbericht of the German Apothecaries' Society only a few months ago, p. 69 of this journal.

E. K.

Die Terpene. Von Dr. Fr. Heusler, Privatdocenten der Chemie in Bonn. Friedrich Vieweg und Sohn, Braunschweig. Ein Bd., pp. XII, 183. 1896. M. 5.00.

It is little more than ten years ago that Wallach began his classic researches on terpenes and volatile oils which have gained for him the cognomen "Messiah of the terpenes" from Flückiger. Only those who have worked their way through the confusing literature of the half century preceding Wallach's investigations can realize the full significance of his labors. The most important result of Wallach's earlier work consisted in the characterization of the known terpenes and the systematizing of these hydrocarbons and their derivations. The light thus thrown on the subject seems to have invited further investigation of this interesting field on the part of others. The field that for a short time seemed to be monopolized by Wallach and his students has once more become common property, as it were, of a large number of chemists. A single number of last year's "Berichte" of the German Chemical Society contained almost one hundred pages on this subject from a number of authors. It may be added that Wallach's most important contributions do not appear in the Berichte but in the Annalen.

The facts with regard to "terpenes and camphors" have become almost legion, yet our true insight into the subject has not increased in the same ratio. In fact we seem to have entered another era of confusion. Ofttimes unwarranted deductions are drawn from facts and the same investigator who set up structural formulas one year is ready to mutilate his own dummy the next year. However, great benefit may be derived from such formulas if they are not based on mere guesswork, or even wrong observations, as has repeatedly been the case.

Under the existing circumstances every person who is directly or indirectly interested in the subject must have welcomed the news that a former assistant of Prof. Wallach had undertaken a compilation of facts pertaining to the subject. Although the author had not specialized in this chapter of organic chemistry, yet for a number of years he was in intimate touch with the work at Bonn and Goettingen and has had the assistance of two experts in this field.

With no up-to-date monograph on the subject almost any complete catalogue of facts would have been welcome. The book before us, however, is more than a mere catalogue, it is also critical in character. As to the arrangement of contents, something might be said in favor of an arrangement more in harmony with modern ideas of organic classification. Yet if we take into consideration that the constitution of not a single "terpene" is known with any great definiteness, the order followed is possibly as good for all present purposes as any that might be suggested. The whole subject is in a transitional stage and will no doubt soon emerge and receive due consideration from the systematists standpoint.

With regard to detail little need be said, so that it is remarkably well up to date. The "Terpenkünstler" as he has sometimes been called may here and there find something to improve or even correct, when viewed from his particular point of view. This might, however, occasionally prove an injustice to the author.

The monograph was originally written for the new "Handwörterbuch der Chemie" in the spring of 1895. The article was then brought up to date in February of this year and published as a separate book. The character of the book work of the firm is too well known to require any special comment. *E. K.*

Contribution to the Flora of Yucatan. By Charles Frederick Millspaugh, curator of the Department of Botany, Field Columbian Museum. Publication 4, Botanical Series Vol. I, No. 1. Brochure, pp. 56, with 4 plates.

Because of its geographical position and geological formation, Yucatan seems to offer especial attractions to the botanist. Despite its tropical position and the proximity of the Gulf Stream, it seems on the whole to be subject to long drouths and from the little known about it, its flora is rather scanty. To enlarge the knowledge concerning the plant life of this peninsula, Mr. Allison V. Armour of Chicago fitted out an expedition which brought back the plants making up a considerable part of the list enummerated.

Under the notes on the individual species, many points of interest to the pharmacist as well as to the botanist are to be noted. Half-tone plates illustrate a species of *Ficus*, also the papaya tree, *Carica papaya* L., both in its wild and in its cultivated state. A new species of *Euphorbia* is also figured. Since an increased knowledge of this flora bids fair to bring to light many interesting facts, further results will be gladly received.

Rodney H. True.

A Course of Home Study for Pharmacists. First lessons in the study of pharmacy. By Oscar Oldberg, Phar. D. The W. T. Keener Company, Chicago. One vol., pp. XXIV, 571, with 150 illustrations. Second edition, revised and enlarged. 1896. Cloth $3.00.

Although pharmacy as a profession will have to do away with the system of apprenticeship, there is no good reason for the hope that so-called pharmacy will soon outgrow its present tendencies toward commercialization. The abolishing of the requirement of practical experience on the part of all the university schools and even numerous colleges of pharmacy has done more than anything else to relegate to history a system that was at one time of the greatest importance, but which has now outlived itself.

The apprentice has for a long time been treated as a stepchild by most preceptors and the present movement toward a higher and broader pharmaceutical education will not tend to improve the conditions of his position. Nevertheless, as long as we must contend with this wellnigh mediaeval institution it may be well not to entirely neglect the training of these would-be pharmacists. The task is on the whole an ungrateful one, yet there are enough apprentices who aspire to something higher, to tempt at least some into the service of teaching the elements of pharmacy to these, on whole, unfortunate disciples of our calling.

That the author has not been discouraged in this task is shown by the fact that he has revised and enlarged his treatise. The preface is followed by an introduction containing some good paternal advice to the prospective student. The body of the book is divided into I. Elements of Pharmaceutical Physics; II. Elements of Chemistry; III. Materia Medica; and IV. Pharmacy.

The writer has had occasion to call attention to the fact that one of the short-comings of the apprenticeship system lay in the fact that the preceptor could not be expected to be a master in physics, chemistry, biology and their more applied pharmaceutical branches, such as pharmacognosy or materia medica, practical pharmacy, etc. This applies, though not with equal force, to the professional teacher who undertakes the instruction of apprentices: either in apprentice schools or through books.

For the same reason the writer may be excused from going into a criticism of the various parts of the book. Among the American books and other devices designed especially for the instruction of apprentices this work ranks among the best. The writer can without hesitation make this statement although he may not agree with the author e. g. in his exposition of the elements of chemistry.

The book-work is on the whole fair, but the printer has repeatedly been guilty of mechanical inaccuracies that are sometimes painful to the eye.

E. K.

Die Methoden der Milchuntersuchung für Aerzte, Chemiker und Hygieniker. Zusammengestellt von Dr. Paul Sommerfeld. Mit einem Vorwort von Dr. Adolf Baginsky. Verlag von August Hirschwald, Berlin. Ein Bd., pp. VI, 57, 1896.

This small book is intended especially for the use of "physicians, chemists and hygienists," and gives in a comprehensive manner methods of analysis for the various milk constituents and milk preservatives. The author has generally been fortunate in the selection of methods, at least from the stand-point of the German chemist. It would be difficult to find a chemist of any other nationality who would consider Soxhlet's areometric method "vorzüglich und ohne jede Schwierigkeit mit geringstem Zeitaufwand auszuführen." There is, however, no accounting for the preference of chemists in different countries for different methods of milk analysis. The English have their Adams' method, the Germans their Soxhlet, and the Americans their sand- or asbestos-extraction method.

The author passes over the rapid methods of fat determination in milk with a mere mention and appears to be under the impression that all of these require expensive machinery and are only adapted for use in large industries (Grossbetriebe), but this is not the case; perhaps ninety percent of the milk analyses made in this country at the present time are made by the Babcock milk test, an inexpensive, quick, accurate method not mentioned by the author, in spite of the fact that it is now used in German and other European dairies, butter and cheese factories. The method is admirably adapted for hospitals, food chemists, milk inspectors, etc.

The original Reichert method for determining the volatile fatty acids of milk-fat is given in the book, although this method is now never used by dairy or food chemists, having been superseded by the Wollny-Reichert method, which gives much more satisfactory results.

These and other points which might be mentioned, to some extent impair the value of the book; but generally speaking, the information given is reliable and the methods recommended up to date, including directions for the detection of preservatives like formaline, sodium fluorid and for the determination of microscopic impurities in milk. An outline of the bacteriological examination of milk is also given.

A few misprints were also noticed in reading through the book: p. 8, l. 3 f. b., 1.829 instead of 1.029; p. 14, l. 19, phosphoric acid for molybdic acid; p. 23, l. 3 f. b. Röse-Gottlieb method erroneously spoken of as a centrifugal method; p. 24, last line, *quecksilberamid*, for mercur-ammonium sulfate; p. 42, l. 3 f. b. 10 for 100.

F. W. Woll.

Anleitung zur ersten Hilfeleistung bei plötzlichen Unfällen. Für jedermann verständlich und von jedermann ausführbar. Unter Mitwirkung von Dr. S. Mehler, herausgegeben von Joseph Hers, ehem. Ober-Lazarethgehilfe d. Armee. Verlag von H. Bechhold, Frankfurt a. M. Ein Bd., pp. 93, mit 26 Abbildungen. M. 1.00.

This little work is a popular edition of the more elaborate and expensive work by the same authors. Several short chapters on the anatomy and physiology of the human body serve as an introduction and are intended to lead to an appreciation of why under given conditions certain things should be done, or, what is equally important, should not be done. The following chapters, twenty-six in all, give directions for first treatment to injured in cases of accident. The book is not intended to replace the physician, but is intended to give such information as may assist in alleviating pain or even saving the life of the patient before the physician can arrive.

The subject of first aid to the injured is receiving more and more attention in this age of machinery. Colleges of pharmacy are beginning to realize the importance of the subject and some are supplying courses of lectures. This little book, which, although greatly abbreviated, is comprehensive in its scope, is so cheap that readers of German will no longer have an excuse for not having a rudimentary knowledge of the subject.

E. K.

Flora of West Virginia, by Charles Frederick Millspaugh and Lawrence William Nutall. Publication 9 of Field Columbian Museum, Botanical Series. Vol. I, No. 2. pp. 276. 3 plates. Chicago, 1896.

In this catalogue, we have the completed successor of the preliminary list, issued in 1892 by Dr. Millspaugh alone. It presents, as far as a list with the usual notes on points of especial interest is able, the flora of the state from the bacteria to the composites. As especially commendable features may be mentioned the departure from the antiquated arrangement of Gray's Manual, when dealing with the seed-bearing plants, and the introduction of two half-tone plates illustrative of *Betula nigra* L. and *Rhus radicans* L.

Rodney H. True.

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EDITORIAL.

Charlatanism in Medical Education.

> "To grasp the spirit of Medicine is easy:
> Learn of the great and little world your fill,
> To let it go at last, so please ye,
> Just as God will!
> In vain that through the realms of science you
> may drift;
> Each one learns only—just what learn he can;
> Yet he who grasps the Moment's gift,
> He is the proper man."

The above quotation from Faust is part of the counsel of Mephistopheles to the student. While dispensing advice to the novice in answer to his queries concerning the theological and legal faculties, Mephisto maintains at least the semblance of an ardent pedagogue. As the student asks for a "kräftig Wörtchen" about medicine, the true devilish spirit gains the upper hand and he makes the above quoted remarks.

These words were possible only in the mouth of a person who knew how over-credulous people are in matters pertaining to the healing art. In this satanic advice lies also the hint that the goal of success lies along the road of charlatanism.

What was true in this respect in Goethe's time is equally true to-day. The people of the *fin de siècle* will as readily sacrifice reason for the elixir of life as those who were willing to be defrauded by alchemist or astrologer. Physicians knowing this to be true, admit that medicine offers a better field for charlatanism than any other profession. The greatest charlatan the world possibly has ever seen, died a multi-millionaire only a few weeks ago.

If the success of charlatanism tempted the student in Faust, it is equally a temptation to the men and women of to-day. The desire for gain, the ambition to be looked up to as a superior person by the people often tempts even the educated physician to take steps that must be pronounced unethical. The number of physicians and surgeons, who give to the reporter the results of their quasi-discoveries or marvelous operations is by no means small. If this is true of the "regular" physician who prides himself that he will not associate with the "irregular or dogmatic", what may be expected of those whose desire for gain is not checked by a strong professional spirit?

The daily press, this boasted educator of the people, not only creates and fosters that kind of charlatanism of the "regular" physician already alluded to, but it daily spreads the poison of secrecy in medicine and the abomination of self-medication with vile concoctions.

That a people whose ethical conception of a noble profession is daily thwarted by villainous literature for which the daily papers are richly paid, should witness complacently fraud and charlatanism of the worst sort even in medical education, is but the natural outcome of the popular education alluded to. Under these conditions it is rather surprising that the state after having granted a charter to a questionable organization, should take steps to revoke its action by withdrawing the charter after considerable harm has been done.

A month ago attention was called to the fact that the attorney-general of Wisconsin had begun action against the Wisconsin Eclectic College of Milwaukee. As ground for his action he states that this so-called college has no faculty, no library, no apparatus, in fact is no educational institution at all, but a mere business enterprise, selling medical diplomas under a charter unfortunately granted by the state.

The circular of the college, with a sarcasm that would do credit to Mephisto himself, is "respectfully dedicated to the thinking citizens of the United States of America." It appeals for support to those who as druggists, nurses, or "students" in medical offices have obtained a sprinkling of medical knowledge and denounces as "absurd, unjust and unreasonable" the requirement of resident study by the "monopoly colleges". It boasts of its legal status and in large letters calls attention to the fact that "it is possible for students to graduate without attendance," also that "the title of M. D. always raises the individual in the social scale, no matter who he or she may be. It also gives to its owner a position and a general authority which is absolutely unattainable by any other means."

That a circular of the Wisconsin Eclectic Medical Society should be permitted to accompany such a prospectus is certainly to be regretted. If physicians were to quit quarreling among themselves; if the reputable element of the various schools could be made to unite for the purpose of state legislation, not for themselves but for the benefit of the people; if a state board of medical examiners had orders to examine all candidates no matter where they got their M. D., much of the damage done by such institutions could be undone. It must, however, be stated to the credit of the Wisconsin Eclectic Medical Society, that the steps taken by the state were taken at the solicitation of the officers of this association.

The reader may inquire of what particular interest a bogus medical college is to pharmacists. The answer lies in the circular letter addressed to pharmacists by this college, of which a copy is given below:—

> "Dear Sir:—If you have any aspirations to a profession which runs side by side with that of Pharmacy, if you desire to become a physician and have the legal right to append M. D. to your name; then you are politely requested to carefully read and digest the contents of the inclosed prospectus.
>
> "The plan as outlined therein gives to the pharmacist an open door, to the legitimate practice of medicine, as an authorized physician. In these days when the Pharmacist is required by law to be as highly educated, as well read, as well versed in the various branches of Medical Knowledge and to pass as rigid an examination (and in some states much more rigid) than is required of the physician; is there, we ask, any reason why the pharmacist should not avail himself of the opportunity (while he has it) to take yet another step on the ladder of life and become M. D.?
>
> "The average pharmacist's knowledge of Materia Medica, Therapeutics, Anatomy, Physiology, Science and Practice of medicine, Obstetrics and Surgery is usually just as good as the average physician, indeed many much better, for there are thousands of practising physicians who never had a diploma, never was asked a question on the subject; while every pharmacist has been through the fires of inquisitorial examination."

This circular letter speaks for itself and requires no comment, not even on its English.

The writer has received inquiries from pharmacists as distant as New York about the character of this institution. It may not be amiss to warn all pharmacists, who have a grain of selfrespect, against the temptations of this institution.*

E. K.

◆

Professional Pharmacy and Unrestricted Competition.

The statement that excessive business competition has the tendency to destroy any professional element in the modern pharmacist has evoked the following comment: "The pressure of competition is now and has always acted as the minister of natural selection. It kills off the unfit and leaves the adapted in possession of the field." If ability or fitness refers to business skill or sagacity or even shrewdness, this no doubt is partly true. The observation can be made almost anywhere that e. g. an old reliable firm is reduced to the verge of bankruptcy because it has avoided distasteful methods of advertising to attract the public. No one will doubt that the articles bought at the old stand are reliable, that the veteran chief clerks at the head of the various departments thoroughly know the kind of goods they are daily buying and selling. On the other hand a new competing firm managed according to so-called "modern business principles" does a flourishing business. It is generally acknowledged that this firm keeps good, bad and indifferent goods and that it makes its fortune by disposing of the poor goods to a credulous public blinded by the cheapness of the price and attracted by extravagant advertisements. The goods in this store are no longer bought but sold. It is further recognized that the cheap help of the advertising firm is paid largely for the amount of gas it can produce and not for the knowledge of goods it is handling. Yet the modern swindler comes out ahead and the honest, conservative dealer has to give up his business or surrender his business principles and do like his competitor. This according to our commentator evidently is the business ability that brings the best to the top and kills off the worthless and deficient. An observing lawyer recently remarked that if advertisers (referring particularly to those of so-called patent and proprietary medicines) had to pay into the United States treasury ten cents for every lie they said, our government would not be in need of revenue. A sad comment on modern "business ability" indeed.

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* The writer has since been informed that this mercenary college has changed its base of operations to 1001 West Congress Street, Chicago.

The survival of the fittest in business is a great lie if by fit we understand honorable qualities.

What is true of the general merchant is even more true of learned professions and particularly of those callings that combine the professional and commercial elements. The medical and legal professions would not to-day be what they are if they were wholly unrestricted. The rank and file in these callings is not what it should be, but it has been raised from a cruder condition by educational requirements, and will be improved in the future by higher educational standards and not by competition with charlatans.

The druggist is in a particularly precarious position. The commercial element cannot be wholly excluded from his calling. The very fact, however, that we now have pharmaceutical legislation of one sort or another in almost every state of the union clearly demonstrates the fact that the people at large do not believe that competition alone will weed out the poor element and leave the fittest to render service to suffering humanity. Pharmaceutical legislation on the whole is not class legislation. If anything it is directed against the druggists, as many in recent years have learned. Pharmaceutical legislation is for the benefit and safety of the public. Pharmaceutical legislation implies restriction, not unrestricted competition. As in medicine and law restriction in pharmacy in this country is not based on concessions, but purely on an educational qualification, however meagre this may be.

Within the past year a pharmacist went on record with the following statement: "It is absolutely impossible for us to inspect all the drugs that we buy and sell." He evidently spoke not only for himself but for his fellow-druggists as well. What this admission of guilt implied he was immediately informed of and he apparently had nothing more to say. The confession "that it is absolutely impossible for us to inspect all the drugs that we buy and sell" was an honest confession. Not only are most druggists educationally unqualified to perform such a task, but such an undertaking would be ruinous from a business standpoint. Competition is such that it does not "pay" to go to college, or if the aspirant goes he cannot afford to spend more than two or three winters, often working during the greater part of the day in drug stores in order to pay his way through college. After he has his coveted diploma it again does not "pay" to keep a "drug store" true to its name, but he must keep soda-water and he must advertise it. He must have cigars, toilet articles and hundreds of other things and he must advertise them. While inventing new schemes for advertisement he has no time to examine the drugs he buys and sells. The writer has not yet learned of the druggist who advertised that he examined every drug which he purchased and that he dispensed none but those which came up to the standard. It is rather strange that if the survival of the fittest applies to pharmacy, that those drug journals, which have in recent years given so many "tips on advertising" have not emphasized this style of advertising and that druggists have not been glad to follow such advice.

The bitter truth is — and the sooner those looking after pharmaceutical legislation swallow this pill without sugar coating the better — that there is too much competition in pharmacy. Don't quarrel about "patent medicines". They are unethical and the sooner they are thrown out of the drug stores the better for the druggists. Many druggists already feel ashamed of them and place them where they are not conspicuous. The cutting evil in general has been discussed year after year and every year invents new schemes to subdue this evil. Remove competition and this will regulate itself. The cutter is not the benefactor of the public. He not only sells remedies cheap, but he also sells cheap remedies. The fundamental idea of all pharmaceutical legislation, the protection of the public, is so little served by our present laws, because they allow excessive competition to go on unrestricted. If the number of druggists is reduced by a high educational standard, pharmacists will not only be able to give all their time and attention to drugs, but they will also be able and willing to examine all the drugs they buy and sell and to assume responsibility for their acts. Under the banner of free and unrestricted competition this has never been possible. The engineer who constructs a faulty bridge will be found out. His case is a simple one. The physician may prescribe a faulty prescription and the pharmacist may compound it. Perchance they may be found out. Chances are in nine cases out of ten they will not be found out. Herein lies the difference between the profession of engineering and that of medicine and pharmacy. The ignorant engineer is soon recognized as such; the charlatan flourishes beside the medical expert; the druggist, who knows nothing about drugs, save their names, their price and how to advertise them, beside him who would be a true servant to the people.

> "Eleuchtet das Jahrhundert ist,
> Der Esel Stroh und Disteln frisst."

E. K.

ORIGINAL CONTRIBUTIONS.

The Periodides of the Alkaloids, as Molecular Forms for Volumetric or Gravimetric Estimation.[*]

By Dr. *Albert B. Prescott.*

RECENTLY PUBLISHED WORK ON PERHALIDES.

Returning now to periodides and their halogen relatives, a few references should be given. A pentaiodide of caesium, and teriodides of caesium and rubidium are among those reported by Wells in 1893,[31] and inadvertantly omitted in my enumeration last year. Pyridine derivative periodides were obtained by Ramsay in England in 1878.[32] These were picoline periodides, the constitution of the picoline not being then established. This year, Wheeler and Walden publish[33] an account of several halogen addition products of the anilides, including a diiodide and a tetraiodide of acetanilide hydriodide, $(C_6H_5.NHCOCH_3)_2.HI.I_2$ and $(C_6H_5.NHCOCH_3)_2.HI.I_4$. A preliminary report[34] on these bodies was made in October 1895. In relation to this subject, reference should be made to the work of Arthur Hantzsch, in 1895,[35] upon halogen derivatives of hydrazins and diazo-compounds. The constitution of diazonium compounds is assumed.

Perhalides of Caffeine.

An extensive and important contribution on this subject has just been made by Dr. M. Gomberg,[36] and some considerable portions of this contribution here follow. Dr. Gomberg's previous papers on this subject[37] entitle him to confidence as a most trustworthy worker of good chemical judgment. From his last paper,[38] which fills 31 pages, I can take here only some of the portions most nearly related to the scope of this article. These selections here follow:

* * *

All the periodides of primary, secondary, and tertiary ammonium salts, including those of pyridine and its derivatives, contain hydriodic acid as the salt-forming acid, and the "periodine" is supposed to be linked to the iodine of this acid. The iodine of the acid, being linked directly to the nitrogen of the base, is not affected by reducing agents, such as sulphurous acid, sodium thiosulphate, nascent hydrogen, etc., while the "periodine" is readily attacked under such treatment, and yields hydriodic acid. The constitution of quaternary ammonium periodides, including those of the quaternary pyridine salts, is entirely similar to that of the tertiary class, the hydrogen of the acid being replaced by an alkyl. The following formulas will make this clear:

$R'''N<^{H}_{I.I_n}$, periodides of tertiary ammonium salts.

$R'''N<^{R}_{I.I_n}$, periodides of quaternary ammonium salts.

The organic bases are also capable of forming other halogen additive compounds, besides the simple periodides. These can be classified as follows:

1. Compounds wherein iodine or bromine is linked directly to the nitrogen without the intervention of a halogen acid, such as pyridine tetraiodide, $C_5H_5N.I_4$,[39] quinoline tetrabromide, $C_9H_7N.Br_4$.[40]

2. Those obtained by the action of monochloride[41] and trichloride[42] of iodine upon bases. They contain both chlorine and iodine linked directly to the nitrogen. Their structure can be represented by the general formula $R'''N<^{Cl}_{I}$. These compounds still retain the power of forming salts by union with acids, as $(R'''NCl.I).HCl$.

3. Periodides wherein the "periodine" is linked to another halogen not iodine. These are few in number, and are all on the quaternary ammonium type, $R'''N<^{R}_{Br.I_n}$.

4. Periodides containing another acid[43] in addition to hydriodic acid, such as in herapathites, periodo-selenites, phosphates, chlorides, etc. But as each contains hydriodic acid, Jörgensen legitimately infers that the "periodine" is in all probability linked to this acid and not to the other.

5. Perbromides of the hydrobromides of bases. Only very few of these have been reported, although it is well known that a great number of alkaloids are precipitated by bromine dissolved in hydrobromic acid. Pyridine,[44] quinoline[45] and nicotine[46] form such perbromides.

All the perhalides of organic bases, so far reported (except the simple periodides), can be referred to one of these five classes. And yet it can hardly be doubted that periodides and perbromides of other salts than hydriodides and hydrobromides respectively, are capable of existence. I have not been able to find any reports upon periodides in which either hydrochloric or hydrobromic acid has exactly the same function as hydriodic acid has in the simple periodides. Such derivatives can only be prepared when precautions are taken to strictly insure the absence of hydriodic acid during the preparation of the periodide, and this has never been the case in the methods that have hitherto been employed for that purpose. In the following pages will be found a description of such periodides of caffeine, which have been obtained by a method different from those that have been described. The compounds have all been prepared by substituting chloroform for alcohol as the medium of reaction, thus eliminating the action of iodine upon alcohol at higher temperatures, and the subsequent formation of hydriodic acid. Not only periodides, but perbromides of similar composition and constitution have been prepared by this method. The method is, indeed, of very general application for such purposes. Periodides of hydrobromides and hydrochlorides of the following bases have thus been obtained: Quinine, quinidine, cinchonine, cinchonidine, strychnine, brucine, atropine and quinoline (of the hydrobromide only).

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[*] Continued from p. 130.

[31] Wells and Wheeler, Am. Jour. Sci. [3], 44, p. 42. Wells and Penfield, Ibid., 43, p. 17.

[32] Phil. Mag. [5], 2, p. 269; 4, p. 241; 6, p. 19.

[33] Am. Chem. Jour., 18, p. 85.

[34] Ibid., 17, p. 612.

[35] Ber. d. chem. Ges., 28, p. 676, 1734.

[36] Instructor in Organic Chemistry in the University of Michigan.

[37] Trimethylxanthine and some of its Derivatives, 1892: Am. Chem. Jour., 14, pp. 611—619.—On the Action of some Inorganic Cyanides upon Chlorocaffeine, 1895: Am. Chem. Jour., 17, pp. 403—420.

[38] Perhalides of Caffeine, Jour. Am. Chem. Soc., 18, p. 347, April, 1896.

[39] Dafert, Monatsh. Chem., 4, p. 509; 1883; Prescott and Trowbridge: J. Am. Chem. Soc., 17, p. 865.

[40] Grimaux, 1882: Bull. Soc. Chim., 58, p. 124.

[41] Dittmar, 1885: Ber. d. chem. Ges., 18, p. 162.

[42] Pictel and Kraft: loc. cit , 72.

[43] Jörgenson, 1876: J. prakt. Chem. [2], 14, pp. 213, 356; 15, p. 65.

[44] Grimaux: Bull. Soc. Chim., 38, p. 127.

[45] Ber. d. chem. Ges., '9, p. 2766.

[46] Ann. Chem. (Liebig), 131, p. 260.

* * *

Periodides of Caffeine.

Caffeine Hydriodide Diiodide, $C_8H_{10}N_4O_2.HI.I_2$.—Tilden reported in 1865,[47] that when a solution of caffeine in dilute alcohol, containing some hydriodic acid, is exposed to sunlight, there appears in a few days a deposit of beautiful crystals, with a metallic greenish appearance, unstable, readily decomposing even at the water-bath heat. He assigned to the compound the formula $(C_8H_{10}N_4O_2.HI.I_2)_2.3H_2O$, and this agrees closely with the results of his analysis. In repeating the experiment, I find that under certain conditions a diiodide is formed, but the results of my analysis show no water of crystallization. Again, the diiodide is formed only when the formation of the crystals is tolerably rapid, as when the solution is kept in a warm place and exposed to direct light, conditions favoring oxidation of hydriodic acid. If, however, the liberation of iodine be very slow, yielding about a half gram of periodide in six or seven weeks, a tetraiodide is produced. The diiodide, obtained as above described, was filtered on a pump, washed with water containing some hydriodic acid, dried on porous plates and finally over sulphuric acid *in vacuo*. The samples were analyzed for total iodine and for the "periodine", or, as Tilden calls it, the "exterior" iodine. The first is estimated by suspending a weighed sample in water, treating with a solution of sulphur dioxide, then precipitating with silver nitrate and nitric acid. The "periodine" is estimated by titrating with a standard solution of sodium thiosulphate. The difference between the total and "exterior" iodine is that which corresponds to the hydriodic acid. Two independent samples thus prepared gave the following results:

	Calculated for $C_8H_{10}N_4O_2.HI.I_2$.	Found. I.	II.
Total iodine..................	66.06	65.12	64.29
Periodine.......................	44.04	44.04	44.18

The diiodide consists of long hexagonal prisms, with a metallic greenish luster. It decomposes readily when moist, but is quite stable when dry. When suspended in water the crystals lose their luster and become coated with a brown-red layer of the tetraiodide. It is soluble in warm alcohol with decomposition, insoluble in ether and chloroform. It melts at 171° C.

Caffeine Hydriodide Tetraiodide, $C_8H_{10}N_4O_2.HI.I_4$.—This is the periodide which caffeine usually forms when it forms any at all, except as above described. It is the most stable periodide of caffeine, and is formed under many different conditions, in both the amorphous and crystalline state. It has been obtained by the following methods:

1. When a solution of caffeine is treated with a solution of iodine in potassium iodide (Wagner's reagent), there is no visible reaction. On the addition of some mineral acid, a heavy amorphous dark-red precipitate is at once thrown down. The precipitation of caffeine in this way is quantitative, and forms the basis of a method for the estimation of caffeine.[48] The composition of this precipitate is, as I have fully described,[49] $C_8H_{10}N_4O_2.HI.I_4$. It was obtained for analysis in many different ways by varying the relative quantities of the reagents employed, but it has always proven to be of the same composition. The samples for analysis were obtained by filtering the amorphous precipitate on a pump, washing with water to remove the potassium salts, drying rapidly on porous plates, and finally *in vacuo* over sulphuric acid. The following are the results of analysis:

	Calculated for $C_8H_{10}N_4O_2.HI.I_4$.	Found. I.	II.	III.	IV.
Total iodine...	76.43	75.12	75.66	75.84	......
Periodine........	61.15	60.79	60.11	60.81	60.76

2. When caffeine is dissolved in chloroform and is treated with a solution of iodine also in chloroform, no formation of any periodide should be noticed, even when the mixture is allowed to stand for weeks. If into this solution dry hydriodic acid gas be now passed, there is at once precipitated an amorphous dark-red periodide, identical in composition with that described under I. Upon analysis it gave the following figures:

	Percent.
Total iodine...........................	75.14
Periodine................................	60.23

3. When a solution of caffeine in hydriodic acid is exposed to sunlight, but the liberation of iodine is hindered either by low temperature, or the presence of some reducing agents in the solution, then the crystals that are formed have the composition of the tetraiodide, and not that of diiodide. They also have a different appearance, being short prisms of a deep blue color. Several samples obtained in this way furnished the following figures:

	I.	II.	III.	IV.
Total iodine...........	......	......	......	75.11
Periodine................	60.26	59.86	59.75	60.60

4. When either caffeine hydrobromide dibromide or tetrabromide is triturated with a solution of potassium iodide in water, there is again produced the same amorphous periodide. It gives upon analysis 59.90 percent of "exterior" iodine.

These four different methods show the great tendency of caffeine to form the higher periodide, which is apparently more stable than the diiodide. Weak base as it is, caffeine readily forms a higher periodide than is produced under similar conditions by many other organic bases.

Properties.—The periodide in the amorphous state and when dry, is of a dark blue-red color. It is quite stable when dry, and can be heated at 100° C. for many days without any appreciable loss of iodine. When moist it readily gives off iodine. Suspended in water, it gives up sufficient iodine to saturate the liquid, and after that remains unchanged. A solution of potassium iodide removes only a little more iodine than pure water alone. The periodide cannot be recrystallized from alcohol without considerable decomposition into caffeine and iodine. It is more soluble in methyl alcohol, and if not too much heat be used in dissolving it, the periodide can be obtained unchanged on spontaneous evaporation of the alcohol in the form of dark-blue needles. Ethyl acetate is, however, the best solvent for this periodide, as the latter dissolves in acetic ether without decomposition, even when heated. On cooling, the periodide separates in fine compact crystals. It is insoluble in chloroform, ether, benzene and carbon disulphide. It melts at 215° C.

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[47] J. Chem. Soc., 18, p. 99.

[48] J. Am. Chem. Soc., 18, p. 331.

[49] Loc. cit.

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[Account is then given of the preparation and elementary analysis of the following mixed halides:]

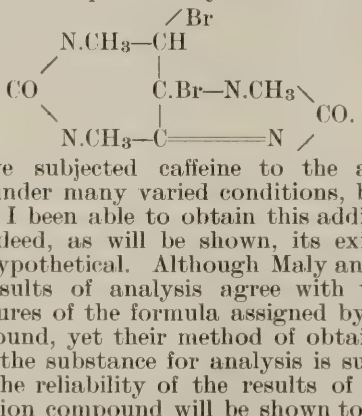
Caffeine Hydrobromide Tetraiodide, $C_8H_{10}N_4O_2.HBr.I_4$.

Caffeine Hydrochloride Diiodide, $C_8H_{10}N_4O_2.HCl.I_2$.

* * *

Perbromides of Caffeine.

The action of bromine upon caffeine has been the subject of investigation many times. When pure bromine is employed, in absence of water, the final action of bromine results in the formation of a substitution product, bromocaffeine, $C_8H_9BrN_4O_2$.[50] In presence of water the action of bromine upon caffeine is for the most part that of an oxidizing agent, as has been shown by Maly and Hinteregger.[51] But under whatever conditions bromine is added to a solution of caffeine or to the dry base, be it as bromine-water or pure bromine, there is at first thrown down an orange-red to a brick-red precipitate. According to Maly and Hinteregger's results of analysis it is a mere addition product, caffeine dibromide, and E. Fisher[52] expresses the same opinion. The constitution of the compound is presumably this:



I have subjected caffeine to the action of bromine under many varied conditions, but in no case have I been able to obtain this addition product. Indeed, as will be shown, its existence is entirely hypothetical. Although Maly and Hinteregger's results of analysis agree with the theoretical figures of the formula assigned by them to the compound, yet their method of obtaining and purifying the substance for analysis is such as to preclude the reliability of the results of analysis. The addition compound will be shown to have the composition $C_8H_{10}N_4O_2HBr.Br_4$, and not $C_8H_{10}N_4O_2.Br_5$. This perbromide losses a portion of its bromine quite readily; consequently, it must be analyzed, or at least protected from exposure, as soon as dry. Hence, Maly and Hinteregger's results, obtained upon samples which have been previously exposed over lime in a desiccator for several weeks, cannot furnish reliable data as to the composition of the original substance. Just as under the action of iodine in presence of hydriodic acid, caffeine exhibits a great tendency to form higher periodides, so under the action of bromine it always forms the tetrabromide of the hydrobromide. This takes place whether hydrobromic acid be added as such or not. When none is added, some hydrobromic acid is produced, either by the action of bromine upon water or by the direct action upon caffeine,

$$C_8H_{10}N_4O_2 + Br_2 = C_8H_9BrN_4O_2 + HBr.$$

It is only under special conditions that lower perbromides of caffeine are obtained.

Caffeine Hydrobromide Tetrabromide, $C_8H_{10}N_4O_2.HBr.Br_4$.—Whenever bromine is allowed to act upon caffeine, this perbromide is one of the first products of the reaction, if not the only one. It is produced in presence or in absence of hydrobromic acid, in presence of water, of chloroform, or when pure bromine is employed.

1. *In Presence of Water.*—When bromine-water is gradually added to a solution of caffeine acidulated with hydrobromic acid, there is produced a yellow amorphous precipitate, which becomes darker and more compact; also, if the addition of bromine be very gradual, the precipitate becomes crystalline. The same compound is however obtained easier, and more crystalline, by the following method of procedure: A stream of carbon dioxide is allowed to bubble through a column of pure bromine, and the fumes of the latter, greatly diluted with carbon dioxide, are carried into a solution of caffeine containing some hydrobromic acid. As the bromine first reaches the solution, the bubble of the gas becomes surrounded with a pale-yellow film, which soon grows darker, and the product finally settles to the bottom as an orange-red crystalline deposit, consisting of distinct small prisms. If the bromine fumes be passed into the solution too rapidly, the resulting product is amorphous. One gram of caffeine furnishes by this method two and three-tenths grams of the perbromide, which is about eighty percent of the theoretical value. The samples for analysis were filtered, by the use of a pump, washed with weak bromine-water, and dried by pressing on very porous plates. When dry, in about two hours, the upper layer of the mass is removed, and the rest is put away in small glass-stoppered bottles, where it remains unchanged for weeks. The washing and drying should not be prolonged any more than is necessary, as the compound loses bromine readily, especially when moist and exposed to open air. The samples were analyzed for the "exterior" bromine and for total bromine. The first was estimated by suspending a weighed quantity of the sample in a solution of potassium iodide, and the iodine thus liberated is titrated with a standard solution of sodium thiosulphate. The total bromine was estimated by precipitation with silver nitrate, in a manner entirely similar to that employed in the estimation of total iodine in the periodides. Several samples, prepared separately, gave the following results:

	Calculated for $C_8H_{10}N_4O_2.HBr.Br_4$.	Found.					
		I.	II.	III.	IV.	V.	VI.
Total bromine:—	67.23	67.37	65.74	67.89	......	......	......
"Perbromine":—	53.78	54.00	52.07	54.04	54.18	53.11	52.58

The addition of hydrochloric acid or sulphuric acid, instead of the hydrobromic, does not give perbromides of salts of these acids, but the same perbromide of the hydrobromide of caffeine.

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[50] O. Schultzen: Ztschr. Chem., 1867, p. 614; E. Fisher: Ann. Chem. (Liebig), 215, p. 264.

[51] Monatsh. Chem., 3, p. 85, (1882).

[52] Ann. Chem. (Liebig), 215, p. 264.

The same product is obtained even if no acid whatever be added. Thus, when fumes of bromine, absolutely free from hydrobromic acid, are passed into a solution of caffeine, there appears after a short time a precipitate of exactly the same appearance and composition as the perbromide described above. The precipitation is much slower than when hydrobromic acid is present, nor is the yield so large. One gram of caffeine yields from two-tenths to three-tenths gram of the perbromide, which is only about eight to ten percent of the theoretical value. Samples for analysis, prepared as previously described, gave the following figures:

	I.	II.	III.
Total bromine	65.92	......	......
"Perbromine"	52.57	53.27	54.75

This is undoubtedly the same perbromide as obtained in presence of hydrobromic acid. The slow precipitation and the small yield point conclusively that a large portion of the caffeine suffers some other changes, namely, those of oxidation and substitution, either of which would give rise to hydrobromic acid. The acid thus produced would at once tend to form the perbromide of the hydrobromide of caffeine. Filtrates from such perbromides invariably give within a short time bulky precipitates of the white bromocaffeine, $C_8H_9BrN_4O_2$.

Great precautions were taken to insure the absence of hydrobromic acid in the bromine used. For this purpose the latter was washed with a solution of sodium hydroxide, then with sulphuric acid, and finally kept under a column of sulphuric acid saturated with silver sulphate. In some experiments the fumes were also passed through a second bottle containing sulphuric acid and silver sulphate. But the perbromide of the hydrobromide was always produced even under these conditions.

Properties.—The perbromide consists of small orange-red prismatic crystals. It melts sharply at 170° C. with previous decomposition into the dibromide, and finally decomposes completely. When suspended in water, it gives up some of its bromine and then gradually and slowly changes into the white bromocaffeine. Two grams of the perbromide change in this way completely in about one week. When spread out on plates and exposed to air for about twenty-four hours, it loses two atoms of bromine, leaving a more stable residue, the corresponding dibromide, which suffers very little loss of bromine on further exposure. The tetrabromide is quite soluble in alcohol, more so when warm, from which it separates, on cooling, in the form of a lower perbromide mixed with some pure caffeine. Methyl alcohol dissolves the tetrabromide very readily, with the production of large quantities of formic aldehyde, and almost complete reduction of the bromine. It dissolves in warm ethyl acetate, and this on evaporation furnishes yellow crystals of a lower perbromide. The perbromide is only slightly soluble in either hot or cold chloroform. Ether removes two atoms of bromine, leaving the yellow dibromide of caffeine hydrobromide. When heated, the tetrabromide loses a portion of its bromine, and finally changes into bromocaffeine, especially at a higher temperature, about 160°—170° C.

2. *Action of Bromine in the absence of Water.*—When a weak solution of bromine in chloroform is added to a solution of dry caffeine in the same solvent, there appears after some hours' standing a deposit of flaky crystals. With strong solutions of bromine the formation of crystals begins to take place at once, the amount constantly increasing. The mother-liquids, after filtering off the crystals, give new crops of the same compound. It was the compound thus produced that was analyzed by Maly and Hinteregger, after being allowed to stand several weeks over lime. The perbromide was filtered, washed with chloroform containing bromine, and dried on porous plates. It was found to be identical in composition with the one obtained similarly but with the previous addition of hydrobromic gas also dissolved in chloroform. The analyses I. and II. are upon samples obtained without the use of hydrobromic acid, while analyses III. and IV. are upon samples prepared with the addition of the acid.

	I.	II.	III.	IV.
Total bromine	68.25	......	......	......
Perbromine	52.25	54.79	54.40	52.82

The perbromide thus obtained is entirely identical in its behavior towards different reagents and solvents with that obtained by the action of bromine upon caffeine in presence of water. It melts at 170° C.

The question may be asked, whence comes the hydrobromic acid that furnishes the hydrobromide of the base? The bromine used in all these experiments was carefully freed from any hydrobromic acid that might have been originally present. The chloroform also was dehydrated for several days over fused calcium chloride, and finally carefully distilled. Blank experiments with absolutely dry chloroform (distilled over phosphorous pentoxide) have established that there is practically no absorption of bromine by the chloroform, when a three percent solution of the halogen in that liquid is exposed to light for several days. Therefore, the hydrobromic acid in the reaction could not have been produced from the substituting action of bromine upon chloroform, a reaction which takes place only at higher temperatures. From the rapid formation of the perbromide when strong solutions of bromine are used, it may reasonably be assumed that at least a portion of the hydrobromic acid, if not all of it, must have been produced directly as one of the products of the substituting action of bromine upon caffeine itself, thus:

$$C_8H_{10}N_4O_2 + Br_2 = C_8H_9BrN_4O_2 + HBr.$$

Additional proof to this theory is lent by the fact that by fractional precipitation, products are eventually obtained which give somewhat higher results for total bromine, while the "perbromine" is about the same. This would point towards the formation of $C_8H_9BrN_4O_2.HBr.Br_5$, a compound, the description of which will be given further on. The last crops of crystals show also a lower melting point, 150°—156° C.; and when the crystals are suspended in water and treated with sulphurous acid, they yield besides caffeine an insoluble precipitate of the white bromocaffeine.

3. *Action of Pure Bromine.*—When dry caffeine is slowly added to pure bromine the first portions go into solution, but further addition produces a dark-red insoluble mass, which was supposed by Maly and Hinteregger, and by E. Fisher, to be the caffeine dibromide, $C_8H_{10}N_4O_2.Br_2$. It is, however, not that, but the same tetrabromide of caffeine hydrobromide just described, mixed with a similar perbromide of bromocaffeine.

Dry caffeine was slowly added to a large excess of bromine free from hydrobromic acid, and the mixture was allowed to stand six hours. The thick dark mass was then spread out on porous plates, and allowed to remain over lime for three days. It was then divided into three portions: (*a*) was analyzed at once, (*b*) was washed with chloroform, and (*c*) was again redigested in pure bromine. The results of analysis are as follows:

	a.	*b.*	*c.*
Total bromine	69.45	68.50	68.03
Perbromine	53.88	54.60	53.07

On treatment with reducing agents there is left a slight residue of the insoluble bromocaffeine, and its formation would readily account for the high results of total bromine. The reaction then in this case is the same as when chloroform is employed. A small portion of the caffeine is at once attacked by the bromine and forms bromocaffeine and hydrobromic acid. The acid at once unites with the unchanged caffeine and forms the insoluble perbromide, thus protecting it against further direct action of bromine; then the bromocaffeine is in its turn slowly changed into a similar perbromide.

So far, then, as experimental evidence goes, the caffeine dibromide, $C_8H_{10}N_4O_2.Br_2$, is entirely hypothetical. It may still be said that the evidence does not exclude the possibility that only two atoms of bromine go to form the perbromide, while the other two atoms are retained by caffeine through the unsaturated linking between the two carbon atoms. Against this view there stands the simple fact that iodine, even in dilute solutions in water, forms the analogous tetraiodide. It is hardly probable that iodine would attach itself so readily to carbon. Then again, no assimilation of either bromine or iodine by caffeine takes place unless some acid be present. Hence, the constitution of this perbromide must be analogous to that of the periodide, i. e., it is a pure and simple caffeine hydrobromide tetrabromide.

Caffeine Hydrobromide Dibromide, $C_8H_{10}N_4O_2.HBr.Br_2$.—When the tetrabromide is exposed to air it loses bromine, and after twenty-four to forty hours there is left a yellow amorphous powder, which is tolerably stable and can be further exposed for many days without any appreciable loss of bromine. The results of analysis show this to be caffeine hydrobromide dibromide. The same compound is obtained by treating the tetrabromide with anhydrous ether. Samples of the tetrabromide were finely powdered under ether, and the digestion with ether was continued until fresh portions of the solvent showed no coloration when added to the perbromide. The yellow residue was filtered, washed with ether, and dried by exposure. It is identical in composition and properties with that obtained by simple exposure of the tetrabromide. Analyses I., II., and III. are upon samples obtained by exposing the tetrabromide to air. Analyses IV. and V. are upon samples obtained by treatment with ether.

	Calculated for $C_8H_{10}N_4O_2.HBr.Br_2$.	Found. I.	II.	III.	IV.	V.
Total bromine:—	55.17	......	53.45	......	54.99	......
Perbromine:—	36.78	36.48	35.50	35.93	36.87	35.83

The dibromide ranges in color from pale-yellow to a decided yellow. It is amorphous, and melts at 170° C. When suspended in water it turns orange-red, and, as analysis shows, is changed into the tetrabromide. It is soluble in ethyl alcohol with less decomposition than the higher perbromide. On cooling the alcohol it separates in distinct tetrahedral crystals, containing less bromine than the original compound (total = 42.50 percent, and "exterior" bromine 27.8 percent). Methyl alcohol dissolves the dibromide even more readily than ethyl alcohol, also with less decomposition than it does the higher perbromide. It is slightly soluble in ethyl acetate, insoluble in chloroform and ether. It remains tolerably permanent when heated to 100° C., but, on prolonged heating, or at higher temperature, it is rapidly converted into bromocaffeine.

* * *

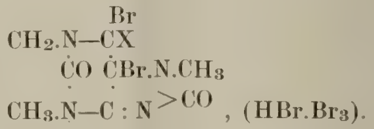
[The author has obtained, further:]

Caffeine Hydrochloride Tetrabromide, $C_8H_{10}N_4O_2.HCl.Br_4$.
Chlorocaffeine Hydriodide, $C_8H_9ClN_4O_2.HI$.
Chlorocaffeine Hydrobromide, $C_8H_9ClN_4O_2.HBr$.
Chlorocaffeine Hydrochloride, $C_8H_9ClN_4O_2.HCl$.
Chlorocaffeine Hydriodide Pentiodide, $C_8H_9ClN_4O_2.HI.I_5$.
Chlorocaffeine Hydrobromide Pentiodide, $C_8H_9ClN_4O_2.HBr.I_5$.
Chlorocaffeine Hydrochloride Tetraiodide, $C_8H_9ClN_4O_2.HCl.I_4$.
Chlorocaffeine Hydrobromide Monobromide, $C_8H_9ClN_4O_2.HBr.Br$.
Chlorocaffeine Hydrochloride Pentabromide, $C_8H_9ClN_4O_2.HCl.Br_5$.
Bromocaffeine[53] Hydriodide, $C_8H_9BrN_4O_2.HI$.
Bromocaffeine Hydrobromide, $C_8H_9BrN_4O_2.HBr$.
Bromocaffeine Hydrochloride, $C_8H_9BrN_4O_2.HCl$.
Bromocaffeine Hydriodide Pentiodide, $C_8H_9BrN_4O_2.HI.I_5$.
Bromocaffeine Hydrobromide Pentiodide, $C_8H_9BrN_4O_2.HBr.I_5$.
Bromocaffeine Hydrochloride Tetraiodide, $C_8H_9BrN_4O_2.HCl.I_4$.
Bromocaffeine Hydrobromide Pentabromide, $C_8H_9BrN_4O_2.HBr.Br_5$.
Bromocaffeine Hydrobromide Monobromide, $C_8H_9BrN_4O_2.HBr.Br$.
Bromocaffeine Hydrochloride Pentabromide, $C_8H_9BrN_4O_2.HCl.Br_5$.

* * *

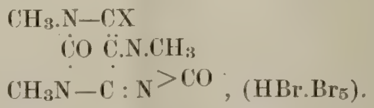
It may be said, that whatever the case be with pure caffeine itself, the perbromides of the halogen substitution derivatives of the base may after all have two bromine atoms linked to the unsaturated carbon atoms, and only the three remaining bromine atoms form the true perbromide. That is, the constitution of the perbromides should be represented by Formula I., and not by II.

I.



$$\begin{array}{l} \qquad\quad\;\; \mathrm{Br} \\ \mathrm{CH_2.N—CX} \\ \qquad \mathrm{\dot{C}O\ \dot{C}Br.N.CH_3} \\ \mathrm{CH_3.N—C:N\!>\!CO},\ \mathrm{(HBr.Br_3)}. \end{array}$$

II.



$$\begin{array}{l} \mathrm{CH_3.N—CX} \\ \qquad \mathrm{\dot{C}O\ \ddot{C}.N.CH_3} \\ \mathrm{CH_3N—C:N\!>\!CO},\ \mathrm{(HBr.Br_5)}. \end{array}$$

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[53] Ann. Chem. (Liebig), 215, p. 272.

In favor of this view, we have the fact that the introduction of a negative group (X) into the caffeine molecule favors the formation of such additive products. Thus, E. Fisher[54] has found that hydroxycaffeine readily unites with bromine, and the resulting additive product has not unlikely this composition: $C_8H_9(OH)N_4O_2.Br_2$. But against this view we have (1) that no such dibromo-additive compounds of either chloro- or bromocaffeine have ever been isolated; (2) that even iodine makes the penta-perhalides, and not the tri-perhalides, as we should otherwise expect, and (3) that the formation of the perhalides of bromo and chlorocaffeine takes place only in presence of some halogen acid.

* * *

(To be continued.)

Pellotine, a New Hypnotic.

By Dr. *A. Heffter*, Docent on Pharmacology at the University of Leipzig.

Under the name of pellote one or several species of cacti are used as a narcotic beverage by the Indians of northern Mexico in the states of Cohahuila and Tamaulipas. Like the cocaleaf in South America, pellote is chewed during races and fatiguing marches. Persons partaking of it are supposed to be able to endure hunger and thirst longer than without it. Medicinally it is used externally as a cataplasm; internally in the form of an infusion against fever. The drug was official in the Mexican Pharmacopœia in 1842. The use of it is also connected with religious rites.

The drug known popularly as pellote seems to be derived from two species of *Anhalonium: Anhalonium Williamsi* (*Echinocactus Williamsi* Lem.) and *Anhalonium Lewinii.* Both species resemble each other externally to such an extent that some connoisseurs regard the latter merely as a variety of the former. The chemical examination, however, has revealed decided differences between these two species of *Anhalonium.* As far as pellotine is concerned *Anhalonium Williamsi* alone comes into consideration. This cactus, which is fairly common on the Mexican plateau, is grayish-green, clubshaped and without spines. The small flower is reddish-violet. Its gently rounded ribs bear areoles covered with woolly hairs.

The diameter of this insignificant plant is 1.5 to 6.0 cm. by 5 to 9 cm.

The juice of the cactus, which is very rich in water, has an intensely bitter taste. The alkaloid pellotine, which is present to the extent of 0.75 to 0.89 percent, can readily be obtained in the following manner:—

The sliced cactus is repeatedly extracted with dilute, ammoniacal alcohol at a temperature of from 40 to 50° C. The yellowish-green extract is distilled until a residue of syrup consistency, which is acid, remains. Water is added and the solution is evaporated to remove traces of the alcohol. Considerable resin, which is insoluble in both acids and alkali, separates. This is removed by filtration. The clear brown-colored filtrate is made alkaline with ammonia and repeatedly shaken with large quantities of ether. The ether is recovered by distillation. The residue, though without a specific odor, possesses a strong alkaline reaction.

The attempt to purify the pellotine through the sulphate was unsuccessful. If the alkaline syrupy residue is diluted with 96 p. c. alcohol and set aside in a desiccator, a considerable quantity of crystals separates within 12 to 24 hours. These are purified by recrystallization from alcohol and lastly from petroleum ether.

Pellotine is a tertiary base, the composition of which is expressed by the formula $C_{13}H_{19}NO_3$. It crystallizes from alcohol in colorless plates, which melt at 110—111°, possess a bitter taste, are difficultly soluble in water, readily in alcohol, ether, acetone and chloroform. As has been demonstrated* pellotine contains two methoxy groups (OCH_3), whereas the third oxygen atom is present in the form of a hydroxy group, the hydrogen of which can be replaced by methyl, benzoyl etc. radicles.

With acids, pellotine combines to form readily crystallizable salts. Of these the hydrochloride can most readily be obtained in a pure form and is therefore best adapted to therapeutic experiments. It crystallizes in colorless prisms, which are readily soluble even in cold water. Alcohol dissolves only traces. From the dilute aqueous solution ammonia gradually precipitates the free base, whereas potassa and soda do not.

In regard to the action of pellotine, our experimental knowledge up to the present time is summed up in the following.

When frogs are injected with 8 to 10 mgr. of the alkaloid, a light narcosis sets in after ten or fifteen minutes. The reflexes are somewhat diminished and a stronger stimulus is required to arouse the animal to the point of making a spring. When laid on its back the animal easily endures the position. This condition lasts 20 to 30 minutes. Then a plain increase of the reflex irritability is to be seen, showing itself, when the animal jumps, in the striking manner in which the legs are thrown and in the abnormally great distance covered at a spring. Soon tetanic convulsions set in which after a time appear without any noticeable external cause and remind one distinctly of strychnine tetanus. When larger doses are used, the tetanic condition is followed more or less quickly by a complete paralysis. The irritability of the motor nerves is reduced only after long-continued convulsions. Very large doses of pellotine which suffice to very quickly bring on paralysis, influence neither the peripheral motor nerves nor the striped muscles. The tetanic attacks appear also in frogs after the destruction of the brain; pellotine causes, therefore, not an irritation of the spasm-center but a hightening of the reflex irritability of the spinal cord.

In rabbits, 0.05 to 0.07 grm. pellotine per kilo brings on a short period of narcosis in which the animal lies on its belly with outstretched extremities and sunken head. It easily wakens from this somnolent condition on being touched but quickly falls back into it again. Respiration is hardly affected, at the most a little slowed. After about half an hour is seen an increase in reflex irritability, a trembling of the head and the animal is easily startled. An external stimulation, a series of tetanic attacks, trismus and opisthotonus, occurs. In larger doses, the animal succumbs during one of these spasms.

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[54] Ann. Chem. (Liebig), 215, p. 272.

* For further information concerning preparation, chemical properties etc., consult the following articles:—"Ueber Pellote" (with an illustration of the drug), Arch. f. exp. Path. & Pharm. 34, p. 65.
Ueber zwei Cacteenalkaloide. Ber. d. d. chem. Ges. 27, p. 2975.
Ueber Cacteenalkaloide. 2. Mittheilung. Ebenda, 29. p. 216.

As regards the action of pellotine on the circulatory apparatus, the frog's heart is not essentially influenced. In the rabbit, at the beginning of the poisoning, a slight slowing of the pulse is to be noticed which quickly disappears. The blood pressure remains essentially unchanged. Only very large doses cause a depression, perhaps a result of the relaxation of the vessels due to the paralysis of the vaso-motor center. This point can be investigated only in animals by the use of artificial respiration since, otherwise, before the relaxation of the vessels occurs, death takes place as a result of the failure of respiration.

The elimination of pellotine seems to take place through the kidneys. At least in one experiment an alkaloid obtained in very small quantity from the urine, gave the reaction of pellotine.

Experiments on healthy human beings have finally shown that doses from 0.05 to 0.06 grm. possess a noticeable narcotic action. About two hours after taking into the stomach, the persons experimented on felt a pronounced sense of weariness, heaviness of the limbs and eyelids and a disinclination to physical and mental exertion. The pulse beat was in all cases diminished in frequency. After about an hour, the effect had passed off, neither headache nor feeling of illness having resulted.

From the above it appears that the point attacked by pellotine is the nervous central organ. Poisoning caused by pellotine shows two stages: one, narcotic, as a result of the paralysis of the brain and a tetanic stage following, due to the abnormally heightened irritability of the spinal cord. Accordingly pellotine would fall into the pharmacological group with morphine.

As regards the therapeutic application, Prof. Jolly of the Charité in Berlin has made clinical experiments from which it appears that pellotine in doses of 0.04 grm. does good service as a narcotic and that it may take rank with morphine among medical resources.

◆

Medicinal Plants of Brazil.[*]

By *Dr. Theodor Peckolt of Rio de Janeiro.*

Nyctaginaceæ.Continued.

Nachtrag zu **Neea theifera** Oersted. Endlich ist es mir gelungen, durch die Güte des Arztes und Pflanzers Dr. Pereira Lima, aus dem Camposgebiete des Staates Minas (do Sul), Blüthenexemplare und eine Portion frische Blätter und Zweige zu erlangen.

Um das darin seinsollende Caffein zu bestimmen, wurden die verschiedenen, in den neueren Werken publicirten Methoden, ausgeführt; doch war es mir nicht möglich, auch nur Spuren des Caffeins zu finden. Ich erhielt mehrfach Krystalle, welche gereinigt sich als anorganisch erwiesen und zum grössten Theile aus Chlorkalium bestanden.

In 1000 Gramm frischer Blätter und frischer dünner Zweige wurden gefunden:

	Blätter.	Zweige.
Wasser	684,782 G.	700,000 G.
Wachsartige Substanz	3,658 "	0,075 "
Fett	5,610 "	——
Weichharz	3,000 "	0,454 "
Harzsäure	8,666 "	7,047 "
Gerbsäure (?)	1,000 "	——
Chlorkalium Krystalle	2,666 "	0,200 "
Extract etc	62,117 "	31,254 "
Asche	43,480 "	50,000 "

Das Fett ist orangebräunlich, geruch- und geschmacklos. Schwefelsäure schwärzt dasselbe, während rauchende Salpetersäure dasselbe entfärbt und damit eine weissgelbliche, weiche Masse bildet. Die Harze sind sämmtlich geruch- und geschmacklos. Die Gerbsäure bildet getrocknet und gepulvert ein gelbbräunliches Pulver von stark styptischem Geschmack, ist in Alcohol und Wasser leicht löslich. Mit Eisenchlorid giebt die Lösung eine schwarze, mit Kaliumchromat eine schwarzbraune Färbung;

Additional on **Neea theifera** Oersted. Through the kindness of the physician and planter, Dr. Pereira Lima, I have finally succeeded in obtaining from the Campos region of the state of Minas (do Sul) flowering specimens as well as leaves and twigs of this plant.

For the determination of the caffeine presumably present, the different methods published in the newer works were used; still I was able to detect only traces of caffeine. I frequently obtained crystals which when purified were found to be inorganic and to be composed in great part of potassium chloride.

In 1000 grams of fresh leaves and the same weight of small twigs was found:

	Leaves.	Twigs.
Water	684,782 g.	700,000 g.
Waxlike body	3,658 "	0,075 "
Fat	5,610 "	——
Soft resin	3,000 "	0,454 "
Resin acid	8,666 "	7,047 "
Tannic acid (?)	1,000 "	——
Potassium chloride crystals	2,666 "	0,200 "
Extract, etc	62,117 "	31,254 "
Ash	43,480 "	50,000 "

The fat is brownish-orange, odorless and tasteless. Sulphuric acid gives it a black color, while fuming nitric acid decolorizes it, leaving a soft, yellowish-white mass. The resins are all odorless and tasteless. The tannic acid when dried and pulverized forms a yellowish-brown powder of strongly styptic taste, readily soluble in alcohol and water. With iron chloride the solution gives a black color; with potassium chromate a blackish-brown color; with baryta a turbidity followed by

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[*] Continued from p. 51. Translated for the Review by Dr. R. H. True, instructor in Pharmacognosy at the University of Wisconsin.

mit Baryt eine Trübung, dann gelatinirend; mit Kalkwasser keine Trübung, wird aber dickflüssig; mit Cinchoninsulfat und Kupferacetat starke Niederschläge; mit Leimlösung Trübung, doch kein käseartiges Präcipitat; mit Brechweinstein keine Reaction.

gelatinization; with lime water no turbidity, becoming, however, thick-fluid; with cinchonine sulphate and copper acetate bulky precipitates; with glue solution a turbidity but no cheese-like precipitate; with tartar emetic no reaction.

Hernandiaceæ.

Hernandia guyanensis Aubl. In den Staaten Para und Amazonas, wird *Paó rosa* — Rosenholz — benannt. Ein 20 Meter hoher Baum mit dichter Krone. Blätter glatt, länglich-oval, an der Basis abgerundet. Blüthenstand schirmtraubenartig mit monœcischen Blüthen. Frucht eiförmig, gerippt und roth gefleckt.

Der Stamm hat ein weisses, schwammiges Holz, welches den Indianern zum Anzünden des Feuers dient. Der Splint ist fest, rosaroth, von Sellerieähnlichem Geruch. Geraspelt, mit Zuckerbranntwein digerirt, hat dasselbe Ruf als Aphrodisiacum. Das Decoct der Rinde, innerlich und äusserlich angewandt, soll als Antidot bei Verwundung mit vergifteten Pfeilen hülfreich sein.

Die ölreichen Früchte dienen als Abführmittel: drei Früchte mit Honig der Waldbiene *Mandasaia*, zur Masse angestossen, auf einmal genommen.

Hernandia guyanensis Aubl. In the states Para and Amazonas is called *Paó rosa*, rosewood. A tree 20 meters in height with dense crown; leaves smooth, oblong-oval, rounded at the base; inflorescence an umbrella-shaped raceme with monœcious flowers; fruit ovate, ribbed and spotted with red.

The stem has a white, spongy wood which the Indians use in kindling a fire. The sap wood is firm, rose-red, with a celery-like odor. When rasped and digested with sugar brandy it is reported to act as an aphrodisiac. The decoction of the bark, internally and externally used, is said to be useful as an antidote in case of wounds from poisoned arrows.

The oily fruits are purgative in action; three fruits ground to a mass in the honey of the forest bees, *Mandasaia*, are taken as a dose.

Berberidaceæ.

Berberis laurina Billb. Vom Staate Minas bis Rio Grande do Sul, heisst *Uva de espinha*, Stacheltraube. Strauch von 1 bis 2 Meter Höhe, besetzt mit dreitheiligen, scharfen Dornen, Blätter in Büscheln bis zu 12, lederig, umgekehrt lancettlich oder verkehrt eirund länglich, ganzrandig und stachelspitzig. Blüthenstand in schlanken herabhängenden Trauben mit dunkelgelben Blüthen. Beere graublau bereift, 9 mm. lang. Die adstringirend schmeckenden Früchte werden als Antiscorbuticum benutzt, das Decoct der Blätter bei Hals- und Mundaffectionen. Das Decoct der Rinde ist ein Volksmittel bei Wechselfieber.

Berberis laurina Billb. From the state of Minas to Rio Grande do Sul; is called *Uva de espinha*, prickly grape. A shrub from 1 to 2 meters in height, beset with three-parted, sharp thorns; leaves in groups of as many as 12, leathern, oblanceolate or oboval-lanceolate, margin entire, ending apiculately; inflorescence in slender, pendant racemes with dark yellow flowers; berries grayish-blue, pruinose, 9 mm. long. The astringent tasting fruits are antiscorbutic. The decoction of the leaves is used in affections of the neck and mouth; that of the bark is a popular remedy against intermittent fever.

Portulacaceæ.

Talinum patens Willd. Kommt vor in allen Staaten Brasiliens. Ist bekannt als *Ora pro nobis miudo* — kleines Paternosterkraut, und als *Beldrœga miuda* — kleiner Portulak.

Eine Pflanze mit aufrechten, an der Basis halbstrauchartigen, wenig ästigen Stengeln. Blätter klein, dickfleischig, glatt, verkehrt eirund oder ovallancettlich. Blüthenstand in endständiger Rispe mit rothen oder gelben Blumen. Frucht eine runde, dreiklappige Kapsel.

Die Blätter werden als Gemüse genossen, selten als Salat. Als Volksmittel dient es zur Heilung von *fluor albus*. Vom ausgepressten Saft der frischen Blätter, mit gleichen Theilen Wasser gemischt, wird dreimal täglich ein Kelchglasvoll genommen. Eine Handvoll dieser Blätter und eine gleiche Quantität *fol. plantagin. Guilleminianæ* (Tauchagem) zu einer Flasche Decoct bereitet dient als Einspritzung.

Sehr geringe Benutzung findet die in den Nordstaaten mit demselben Volksnamen bekannte *Talinum ramosissimum* Rohrb., welche ebenfalls als Gemüse, sowie als ein hællendes Getränk benutzt wird. Die Samen mit Wein macerirt, sollen als Emmenagogum wirksam sein.

Portulaca oleracea Linn. Wahrscheinlich durch Zufall von Portugal schon im 16. Jahrh. eingewandert, hat sich diese Pflanze in allen Staa-

Talinum patens Willd. Is found in all the states of Brazil and is known as *Ora pro nobis miudo* — small paternoster plant, and as *Beldrœga miuda* — small portulaca.

A plant with upright, sparingly branching stem, half-shrubby at the base; leaves small, thick and fleshy, smooth, inversely oval or oval-lanceolate; inflorescence a terminal panicle with red or yellow flowers; fruit a round, three-valved capsule.

The leaves are used as greens, seldom as a salad. It is a popular remedy for *fluor albus*. The juice expressed from the fresh leaves is mixed with an equal part of water and a wineglassful is taken three times a day. From a handful of these leaves and a like quantity of *fol. plantagin. Guilleminianæ* (Tauchagem) a bottleful (Flasche) of decoction is prepared which is used as an injection.

Talinum ramosissimum Rohrb., known by the same popular name, finds a very limited use in the northern states, where it is used as a pot-herb and as a clarifying beverage. The seeds macerated with wine are said to be effective as an emmenagogue.

Portulaca oleracea Linn. Probably introduced accidentally as early as the 16th century from Portugal, this plant has spread throughout

ten als Unkraut verbreitet, doch wird dieselbe nie kultivirt. Sie ist bekannt als *Baldrœga* oder *Beldrœga*, in den Nordstaaten als *Caa-ponga*. Die häufigste Benutzung findet diese Pflanze als Gemüse. Sie ist sehr beliebt als Salat, besonders wenn derselbe statt mit Essig mit Limonensaft bereitet ist.

Portulaca mucronata Link. Ist vom Aequator bis zum 25° südlicher Breite verbreitet. Im Staate Pará heisst dieselbe *Càruru*—Gemüseblatt; in Maranhon *Benzãs de Deos*—Gottessegen, sowie *Bredo maior*—grosser Amarant; in den Nordstaaten *Lingua de vacia*—Ochsenzunge; in S. Paulo, Minas und Rio de Janeiro *Maria Gomes und João Gomes*.

Der aufrechte, etwas holzige, nur an der Basis ästige Stengel hat lancettlich-spatelförmige, spitze Blätter. Der Blüthenstand ist endständig mit 2 bis 3 gelben Blüthen. Die Frucht ist eine verkehrt eiförmige Kapsel mit zahlreichen, nierenförmigen, schwarz metallisch-glänzenden Samen.

Das Decoct dient als kühlendes, erweichendes Getränk bei fieberhaften Affectionen; die Blätter als Gemüse und Salat wie die Vorhergehenden. Zum Salat werden jedoch nur die jungen Blätter gebraucht.

Portulaca grandiflora Hook. In den Staaten Pará, Amazonas, Matto Grosso, St. Paulo und Minas; in den drei ersteren als *Perexi* und *Perrexi*, in den letzteren als *Amor crescido* bekannt.

Die wilde Pflanze hat zahlreiche, holzige Stengel mit fleischigen, schmal-linearischen, spitzen oder stumpfen Blättern, in den Achseln derselben mit langen, weissen Haaren bekleidet. Die Blüthen sind gelb, dicht gedrängt an den Spitzen der Aeste, die Kapseln und Samen ähnlich den Vorhergehenden.

Die schleimreichen Blätter dienen innerlich als gelindes Diureticum, äusserlich als Umschlag bei entzündeten Hautaffectionen. Auch wird die Pflanze allgemein als Zierpflanze in den Gärten verwendet, doch vorzugsweise die Farbenvarietäten, deren Samen aus Europa importirt werden.

Portulaca pilosa Linn. Kommt vor in allen Staaten bis zum 36° südlicher Breite. Im Staate Pará ist derselbe ebenfalls als *Parrexi* bekannt; in Alagôas als *Alecrim de S. Jose;* in den anderen Nordstaaten als *Càa-ponga* und in den Südstaaten als *Amor crescido*.

Mit zahlreichen niederliegenden Aesten, Blättern und Blattachselhaaren, ähnlich den vorigen. Blüthenstand endständig mit 2 bis 3 gelben oder purpurrothen Blüthen. Kapsel verkehrt eirund, fast kugelig, mit schwarzbraunen, mattglänzenden Samen.

Wird nicht zur Speise benutzt. Die Blätter schmecken bitter. Jedoch wird die Pflanze als Tonicum und Diureticum geschätzt. Sie findet vielfache Benutzung als Volksmittel bei Erysipelas. Der ausgepresste Saft dient als Umschlag. Auch dient sie als Zierpflanze in den Gärten.

all the states as a weed. It is never cultivated. It is known as *Baldrœga* or *Beldrœga*, in the northern states as *Caa-ponga*. It is highly esteemed as a salad, especially when prepared with lemon juice instead of vinegar. It finds most frequent use, however, as a pot-herb.

Portulaca mucronata Link. Is distributed from the equator to 25° S. Lat. In the state Pará it is called *Càruru*—pot-herb leaf; in Maranhan *Benzãs de Deos*—God's blessing, as well as *Bredo maior*—large amaranth; in the northern states *Lingua de vacia*—ox tongue; in S. Paulo, Minas and Rio de Janeiro *Maria Gomes* and *João Gomes*.

The upright, somewhat woody stem branching only at the base, has lanceolate-spatulate, pointed leaves; the inflorescence is terminal with two or three yellow flowers; the fruit is an obovate capsule with numerous, kidney-shaped seeds, black in color with a metallic lustre.

The decoction affords a cooling, emollient drink in fever-like affections; it is also, like the foregoing species, used as a pot-herb and salad.

Portulaca grandiflora Hook. In the states Pará, Amazonas, Matto Grosso, S. Paulo and Minas; is known in the first three states as *Perexi* and *Perrexi;* in the remaining states as *Amor crescido*.

The wild plant has numerous woody stems with fleshy, narrowly-linear, acute or blunt leaves, in the axils of which are situated long, white hairs; the yellow flowers are closely crowded at the ends of the branches; the capsules and seeds resemble those of the foregoing.

The leaves, rich in mucilage, are taken internally as a mild diuretic and are used externally as an application in inflamed skin affections. The plant is also commonly cultivated in gardens for ornamental purposes. Usually, however, colored varieties raised from seed imported from Europe are found.

Portulaca pilosa Linn. Is found in all states as far south as 36° S. Lat. In the state Pará, it is likewise called *Parrexi;* in Alagôas *Alecrim de S. Jose;* in the other northern states *Càa-ponga*, and in the southern states *Amor crescido*.

With numerous decumbent branches, leaves and axillary hairs as in the foregoing; inflorescence terminal with two or three yellow or purple-red flowers; capsule inverted oval, almost spherical with blackish-brown, dull-shining seeds.

Not used as a food since the leaves have a bitter taste. The plant is esteemed as a tonic and diuretic and is frequently employed as a popular remedy for erysipelas. The expressed juice is used as an application. The plant is also used for ornamental purposes in gardens.

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Strontium Salicylate.

By *Ferd. A. Sieker.*

A number of strontium salts have in recent years found application in medicine, and three of them, the iodid, bromid and lactate are recognized by the United States Pharmacopœia of 1890. Since then a demand for the salicylate arose.

Although the salicylate of barium and calcium were described a long time ago[1] and the magnesium salt was described by Milone[2] in 1886, the strontium salt appears to have been first prepared in 1894 by Mr. F. W. Haussmann[3]. In his experiments he prepared it by double decomposition as well as by saturation.

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[1] Picra, Annalen der Chemie, Vol. 93, p. 262.

[2] Fischer, Die Neueren Arzneimittel, 4th edition, p. 20.

[3] Proceeding American Pharm. Ass'n. 1894, Vol. 42, p. 1070.

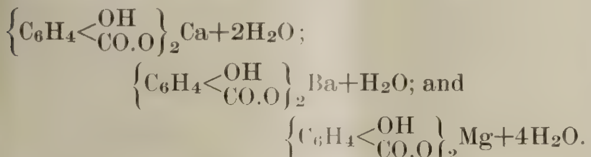
I have found saturation satisfactory; the precautions necessary are the selection of a pure carbonate (free from barium) and avoiding contact with iron and overheating.

The purity of the carbonate may be determined by titration with volumetric acid and a special test for barium should be applied as follows:

1 gm. of carbonate if exactly neutralized with acetic or hydrochloric acid, and diluted with water to 10 cc. should not be rendered turbid after the addition of a few drops of potassium dichromate, T. S.

To prepare strontium salicylate, mix 276 parts of salicylic acid with 3500 parts of distilled water and almost neutralize with strontium carbonate for which purpose about 148 parts are necessary. In working on a small scale a porcelain dish is used, and a temperature of about 80° C. is necessary. The hot, slightly acid solution is rapidly filtered and evaporated to about ½ of its volume and set aside to crystallize. The mother liquor is concentrated by evaporation and another crop of crystals are obtained, etc. The crystals are washed with cold distilled water and dried at the ordinary temperature, or at a temperature of about 50° C. The crystals thus obtained possess a pinkish shade, but form a pure white powder. The reaction of the salt if crystallized from a slightly acid solution, is feebly acid toward sensitive litmus paper but on recrystallization a neutral salt can be obtained.

The composition of strontium salicylate does not appear to have been recorded. According to the references cited above, the composition of the calcium, barium and magnesium salts are respectively as follows:

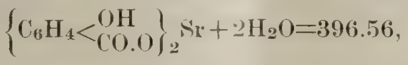


$$\left\{C_6H_4<\substack{OH\\CO.O}\right\}_2Ca+2H_2O;$$

$$\left\{C_6H_4<\substack{OH\\CO.O}\right\}_2Ba+H_2O; \text{ and}$$

$$\left\{C_6H_4<\substack{OH\\CO.O}\right\}_2Mg+4H_2O.$$

In order to determine the composition of the strontium salt, a small quantity prepared as above was recrystallized, so as to obtain a neutral salt; 0.8235 gm. dissolved in hot water was titrated at the boiling temperature with $\frac{N}{2}Na_2CO_3$, using phenolphtalein as indicator. Required 8.2 cc. (2 estimations), which is equivalent to 21.73% Sr. This conforms quite closely to the formula:



$$\left\{C_6H_4<\substack{OH\\CO.O}\right\}_2Sr+2H_2O=396.56,$$

which requires 22.01% of Sr., while a salt with one molecule of water would require 23.05% and a salt with three molecules of water of crystallization, 21.06% of Sr.

Strontium salicylate requires about 18 parts of water for solution at 20° C., but is very much more soluble in boiling water. It is sparingly soluble in cold alcohol.

An aqueous solution (1:20) prepared with the aid of a gentle heat should be colorless, or at most possess a pinkish tinge. Such a solution should be clear and free from insoluble matter. It should be neutral or only feebly acid toward sensitive litmus. The salt responds to the usual tests for strontium and salicylic acid.

If 1 gm. of the salt be ignited in a crucible and the residue dissolved in a slight excess of acetic acid diluted with water to 10 cc., filtered and a few drops of potassium dichromate T. S. added, no precipitate or turbidity shall result, (absence of barium).

The purity of the salt can also be determined by titration with $\frac{N}{2}Na_2CO_3$ as described above. If the reaction of the salt used for titration is feebly acid, it should be neutralized with $\frac{N}{2}NaOH$ before titrating with $\frac{N}{2}Na_2CO_3$. The number of cubic centimeters used multiplied by .013767 indicates the amount of free salicylic acid present, which must be deducted from the original weight used. The number of cubic centimeters of $\frac{N}{2}Na_2CO_3$ used multiplied by .09914 will indicate the amount of pure strontium salicylate present.

Laboratory of Lehn & Fink, New York.

TRANSLATIONS.

Remedies from the Animal Kingdom in use Formerly and at the Present Time.*

By *B. Seybold.*

Linteola intinct. sanguine leporis,	Linen steeped in hare's blood.
Linteola intinct. spermate renar.,	Linen steeped in frog's spawn.
Lumbirici terrestres,	Earthworms.[15]
Mandibulæ lucii,	Pickerel jaws.
Margaritæ,	Pearls.
Mater perlarum,	Mother-of-pearl.
Mel commune,	Ordinary honey.
Mel virgineum,	Virgin honey.
Moschus,	Musk.[16]
Mumia cervi,	Deer mummy.
Mumia officinar,	Mummy.[17]
Mumia vulgaris,	Common mummy.
Mustella usta,	Incinerated weasel.
Nervi lupi,	Wolf-sinews.
Nidus hirundinum,	Swallow's nest.
Oculi lucii piscis,	Pickerel eyes.
" lupæ et lupi,	Eyes of a she- and he-wolf.
" lyncis,	Lynx eyes.
Os de corde cervi,	Bone from the heart of a deer.[18]
Ossa humana,	Human bone.
" sepiæ,	Cuttle-fish bone.
Ova formicarum,	Ant eggs.
" gallinacea.	Hen eggs.
" struthionis,	Ostrich eggs.
Pellis arïetina,	Ram's pelt.
Pili cati combust,	Incinerated cats' hair.
" cervi,	Deer's hair.

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* From Apoth. Ztg. Translated for the Review by Richard Fischer, Instructor in Practical Pharmacy, University of Wisconsin. Continued from p. 110.

[15] Earthworms were carefully handled; before being used they were well washed with wine. Literature: Stahl G. E. pres. J. C. Fritschius resp. de lumbricis terrestribus eorumque usu medico Halæ.—1698—Juch H. P. pres. T. E. Weinknecht resp. de lumbricis terrestribus, Erfurt. 1742.

[16] Gessner mentions the following test: "Echter Bisam schwimmt auf Rosenwasser, die Verfälschungen sinken zu Boden." Concerning the origin of musk, Megenberg writes: "In des tiers leib wehset ain apostem (tumor) von gesamneter fäuchten, wenn das zeitig wird, so reibt sich das tier an ainem paum, unz daz apostem zepricht und der unflât her auz fleuzt. wenn das hart wird so haizt er ze latein muscus, das ist ze däutsch pisem."

[17] In using mummies, the action did not depend so much upon the dried flesh, as upon the balsams and resins that had been added as preservative agents.

[18] An ossified muscle in the wall that separates the chambers of the heart.

Pili hirci,	Buck's hair.
“ leporis,	Rabbit's hair.
Pluma perdicum,	Partridge feather.
Porcelletæ,	Porcelain-shells.
Priapus cervi,	Yard of a stag.
“ ceti,	Yard of a whale.[19]
“ tauri,	Yard of a bull.
“ ursi,	Yard of a bear.
“ vulpis,	Yard of a fox.
Propolis,	Beeglue.
Pulmo cervi,	Deer's lung.
“ ursi,	Bear's lung.
“ vituli,	Calf's lung.
“ vulpis,	Fox's lung.[20]
Rana arborea,	Tree-toad.
“ fluviatilis,	Water-frog.
Reguli usti,	Incinerated wrens.
Sanguis cervi,	Deer's blood.
“ columbar.,	Dove's blood.
“ hirci,	Buck's blood.[21]
“ hirci silvestr.,	Roebuck's blood.
“ hominis,	Human blood.
“ leporis,	Rabbit's blood.
“ porcelli,	Blood of a sucking pig.
“ porci,	Hog's blood.
“ vituli,	Calf's blood.
Scarabeus cornutus,	Stag-beetle.
“ majalis sive unituarius,	May-worm.[22]
Scorpio,	Scorpion.[23]
Secundinæ primiparæ,	After-birth of a first-born.
Sericum crudum,	Raw cocoon.[24]
Serpentes exsiccata,	Dried serpents.
Sperma Ceti,	Spermaceti.[25]
Sperma ranarum,	Spawn of frogs.
Spina mustella piscis,	Burbot's spine.
Spina viperarum,	Serpent's spine.[26]
Spongia marina,	Sponge.
Stercus angninus,	Snake excrement.
“ anseris,	Goose excrement.
“ cervinus,	Deer excrement.
“ columbar,	Dove excrement.
“ humanus,	Human excrement.
“ leonis,	Lion excrement.
“ murium,	Mouse excrement.
“ pavonis,	Peacock excrement.
“ vaccininum,	Cow excrement.
Stincus marinus,	Sea-lizard.
Tali capreoli,	Ankle-bone of a roe.
“ cervi,	Ankle-bone of a deer.
“ leporis,	Ankle-bone of a rabbit.
Talpa usta,	Incinerated moles.[27]
Telæ aranearum,	Spiderweb.
Testæ cancrorum,	Shell of a crab.
“ cochlear.,	Snail shells.
“ concharum,	Muscle shells.
“ ostreorum,	Oyster shells.
“ ovorum e quibus pulli exclusi sunt.,	Shells of eggs from which chickens have been hatched.[28]
Testiculi apri,	Wild boar testicles.
“ castoris,	Beaver testicles.
“ cervi,	Deer testicles.
“ equorum,	Horse testicles.
“ lupi,	Wolf testicles.
“ ursi,	Bear testicles.
“ vulpis,	Fox testicles.[29]
Testudo,	Turtle.
Typhus cervi,	“Hirsch Kolben.”
Ungulæ alcis,	Elk hoofs.
“ asini,	Donkey hoofs.
“ bovis,	Ox hoofs.
“ capræ,	Goat hoofs.
“ equi,	Horse hoofs.
“ lyncis,	Claws of a lynx.
“ mulae,	Mule hoofs.
Umbillici marini,	Sea-navel.
Unicornum fossile,	Fossil unicorn.
Unicornum magrinum,	Narwal.[30]
Upupa usta,	Incinerated cuckoo.
Urina hominis,	Human urine.
Ventriculi gallinarum exsicc.,	Dried chicken's stomach.
“ intestina gallinar. stomachar.,	The inner membrane from a chicken's stomach.[31]
“ lupi,	Wolf's stomach.
“ urogalli,	Mountaincock's stomach.
Verucæ equorum,	Warts from a horse.
Vesica apri,	Wild boar's bladder.
“ bovis,	Ox-bladder.
Vespertilio ust.,	Incinerated flying-squirrel.

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[19] Used as an aphrodisiac. Besides that, it was supposed to act as an astringent and therefore was administered in diarrhœa and hemorrhages. Dose, 1 scruple to 1 drachm. Pharm. Wirtemberg. 1760.

[20] “The fresh lungs are washed with wine and dried. They are recommended in pulmonary diseases and are required in the preparation of Looch de vulpis pulmone.” Pharm. Wirtemberg, 1760. “Fuchslungensaft” is still sold in some localities.

[21] Lonicer says concerning this: “Dieses Tier ist dermassen hitzig von Natur, dass man den Demant, welchen weder Feuer noch Eisen zähmen und bewältigen mag, allein mit seinem Blut zerbricht. Bocksblut hat grosse Kraft, dass auch die scharffen Eisen damit geschärft und gehärtet, und von ihrer Grobheit mehr gereinigt werden, dann mit einer Feilen.”

[22] Details can be found in: “Bekanntmachung des specifiquen Mittels wider den tollen Hundebiss, welches Sr. Königl. Majestät zum allgemeinen Besten vom Besitzer erkaufen, untersuchen und dessen Gebrauch in vorkommenden Fällen dem medizinischen Collegio und dem gesammten Publiko empfehlen lassen, durch höchst deroselben Ober-Collegium Medicum Berlin 1777.”

[23] Compare Peters, Bd. II, p. 41 ff. Megenberg makes the following statement: Wer vergiftet wird von dem scorpen, der verzeuht drei tag ê er sterb | und spricht man | wer den scorpen aschen in wein drink | das sei ain erznei dâ wider.— der scorp hât ein art | das er des Menschen teur (sc. palma—flat of the hand) in der Hand nicht hekt | er rüert neur rauch stet gern | dâ hâr ist | und daz öl | das von den scorpen kümt daz ist guot für sein pizz | also daz man die wunden damit salbt.

[24] Compare Peters, Bd. II, S. 21 ff.

[25] Compare Peters, Bd. II, S. 27 ff. Lonicer reports: “Walsaat oder Walsam, Walrode, wird für den Saamen oder Natur des Wallfisches gehalten, und daher also genannt, heisst auch Baldrath, weil er bald hilft und Rath thut in etlichen Gebrechen also sonderlich wider das gestürzte Blut. Das Sperma Ceti wird auf dem Meer gefunden. Die Meerfischer sagen es sey der Saame des Wallfisches.

[26] Gessner gives two folio-pages on the wonderful effect of vipers; among others, the following: “Ein gleych Fall hat sich (says Galenus) nit weyt von unsern heimat begeben: Ein aussetziger und maltziger man zoche zu warmen bädern | dess vorhabens seiner Krankheit darin abzuwarten und dadurch zu heilen. Dieser hat bey sich eine schöne junge leybeigne Köchin | der er alle hausshaltung vertrauwet und übergab. Als aber vil nattern zunechst umb jr herberg schweifften | und sie den weynkrug nit wohl vermachet und verwart | schloff ein natter darein | und ertrank darinn. Die Köchin ward dessen froh | wolt sich des mittels zu des sondersichen verderben gebrauchen | und gab ihm den weyn zu trinken | aber das glück spilte das gegentheil | und gerieth zum besten | also dass er darauf widerumb frisch und gesundt wardt.”

[27] “Wenne man den schern prennet ze pulver und sprenget in mit ain waizen ains ais auf der siechen antlütz, daz ist guot für den auzsetzel.” Megenberg.

[28] The Pharm. Wirtemb., 1760, gives the following: “Die Schalen aus denen durch Bebrüten Junge ausgekrochen sind, werden für besonders wirksam gegen Nierenleiden und zum Abtreiben von Harnsteinen gehalten. Doch zieht man getrocknete und zerriebene den gebrannten vor.”

[29] All these were employed as aphrodisiacs.

[30] According to Valentinis, the true remedy is obtained from the fish norwal. The existence of a quadruped by that name is denied. The “unicorn” as found in the market came from the above mentioned fish only. A wonderful case of antidotal action in acute poisoning is reported from Augsburg, but the author does not believe that the results can be ascribed to the unicorn alone. Unicorn. fossile is also mentioned. Concerning its source, the various ideas then prevalent are given without the author's deciding in favor of one or the other.

Gessner reports the following tests: Administer to two doves some arsenic, in one case accompanied by some unicorn. If the dove to which no unicorn has been given, dies, the unicorn is genuine.

[31] Therefore a precursor of “Ingluvin”, which for several years has been used as a “new remedy”.

Viperæ italicæ,	Italian vipers.
Vulpis exsicc. et ust.,	Dried and incinerated foxes.
Zibethum,	Civet.

The number of remedies furnished to medicine by the animal kingdom previous to this time must have been extremely large. The above list includes 310 remedies, of which 79 are fats. The last edition of the Pharm. Germanica has only 13 official.

For a long time, even to the end of the last century, these remedies retained their place in the pharmacopœias and price-list. In old apothecary-shops, a greater or lesser number of these curiosities can still be found. It is therefore small wonder that among the common people a number of such things are still being employed for curing disease.

(To be continued.)

MONTHLY REVIEW.

The Function of Pharmacy in the Social Body, its Responsibilities to the Public and to the Physician.*

By Prof. *A. B. Prescott.*

Although the position of the poet, the minister of the gospel and even of the lawyer is essentially the same as it was a hundred and more years ago, the position of those callings dependent on the modern growth of the natural sciences has been radically modified. So medicine, pharmacy and chemistry have been revolutionized. Chemistry outgrew medicine and in this century pharmacy, as the speaker demonstrated by the life history of the principal chemical journal of to-day, the Annalen der Chemie, which began its history as Annalen der Pharmacie by the amalgamation of several pharmaceutical journals under Liebig in 1832.

Specialization, however, is going farther. It has already affected medicine to a considerable extent and even chemistry and pharmacy have felt its influence. The pharmaceutical manufacturer, who must be included in the ranks of pharmacy, is a product of this specialization.

Pharmacy, like other callings and institutions, is a product of our present-day civilization. The pharmacist is under obligations to the medical practitioner on the one hand and to the public on the other. The pharmacist, however, has obligations to the public other than as a mere check between the physician and his patient. The citizen is free to select not only his medical adviser, but he may chose to go to the apothecary as well as to his neighbor or relative. In fact he can choose his own remedies without the recommendation of anyone. This places the pharmacist in a position that is often fraught with great responsibility and risk. Not only in selling medicines to persons acting as their own physicians, but in selling poisons in general, whether for medicinal or other purposes, the responsibilities of the pharmacist are greater than the recompense for such services. It is but natural that the people should frequently go to the pharmacist for advice, and it is equally true that the pharmacist is not responsible for the duties of another. In the latter respect he is not even responsible for the sale of secret medicines as long as their sale is lawful. Nevertheless it were better, no doubt, to restrict the sale of poisons in medicines of secret composition to the skilled as well as that of poisons known as such to the public.

The tendency of the public is to place due restriction on the sale of such articles, as is manifested by recent legislation against deceptions in the sale of foodstuffs and beverages as well as of drugs and medicines. This change is taken advantage of by designing men and a good degree of conservative prudence and a great deal of patience is needed during this transitional stage of modern development.

Pharmacists as a profession have done much in unravelling the secrecy of secret proprietary medicines. They, as individuals, occupy positions of responsibility as pharmaceutical and analytical chemists. They will in the future assume the position as medical chemists. "The new pharmacy is not a chimera, nor a dream. Neither is it only a prophecy, the prophecy of clear sighted men, that the new pharmacy is to take up medical chemistry in its full extent. It is already an individual purpose. Business ability is making a study of the ways and means for a pharmacy that shall fill its true office in the practice of medicine. It is not for me to say where the model of a pharmacy is being planned, nor where it will arise and assert itself in the United States. However conspicuous the departure may be, there will be numbers having a like intent. There are even now modest young men who are at work, men richer in qualifications than in money, but most rich in determination, not lacking in tact, enthusiastically at work upon the arrangements. The foundations of the new pharmacy are being placed, and it will be well established in business before the century closes.

"Physicians will make a great mistake if they do not support true pharmacy, even the new pharmacy, and encourage medical analysis in the hands of the pharmacist. It will be a mistake for themselves as well as for the public. Let the physician do as much analytical work with his own hands as his time and his skill will permit. There is much medical analysis requiring more continuous attention than the doctor can give. When there is more laboratory work than the physician can compass, let him find the pharmacist of analytical training and judgment. He ought to find the right man in the new pharmacy. Its laboratory, with instruments of precision and skilled attendant not subject to interruptions by visits to the sick, is to be at the service of the physician.

"The profession of medicine cannot afford to be indifferent to the interests of true pharmacy. They cannot afford to furnish their patients mainly with the ready-made remedies of the manufacturer, all cut out in sizes like so many ready-made coats. Ready-made things never fit the individual to perfection, even when the person is in health and with full bodily symmetry. How then shall ready-made medicines fit those who, being sick, are out of shape in the balance of the body? A man whose two shoulders do not square with each other will not buy a ready-made coat. How long will the man whose functions are deranged be satisfied with the administration of a formula in pellets made up by the manufacturer for everybody all alike? Sickness is idiosyncrasy, and intelligent people know it. Therefore it is that they apply to a physician, to have treatment to fit each case by itself. Otherwise they would think they could fit themselves without the physician's aid, something they are only too much inclined to do.

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* Abstract from an address delivered before the Minnesota Pharmaceutical Association, at Lake Minnetonka.

"It is by co-operation of true pharmacy, with its precise adaptation of identified medicines of exact strength and purity, that the physician can best maintain his own profession in the eye of the public. It will be by means of the new pharmacy and its laboratory of chemical and microscopical examinations where analyses go on in undisturbed seclusion that the physician can the better satisfy his own mind in the more perplexing cases that sometimes turn the balance for him or against him in the minds of his patrons. We may be sure that true pharmacy will earn its own place in the organization of society.

"Nothing that I have said should be so misunderstood as to imply a want of respect for the trade interests of the present time. The commercial pursuit is honorable equally with professional practice. The mercantile virtues are among the best elements of character. The business training of a good drug trade, with its thrift and frugality and industry, its good order in respect to time and place and system, these give the young man good discipline indeed. Young men may be assured that, whether in the college or in the school, it is industry and fidelity that will win, it is negligence and duplicity that will fail. Steady work and honest pluck succeed in study, or succeed in trade.

"So in the organization of the pharmacists of any state, commercial interests are a proper subject of deliberation and concern. At the present time business at large is laboring under depression and anxiety, in all which pharmacy bears its share. And it has a heavier load in the commercial difficulties of its own affairs. When I hear from well qualified pharmacists, of various cities in my own state and elsewhere, as they tell me in the candor of personal confidence, how neither business activity nor economy has availed to bring returns of encouragement, I must confess I share in their depression. Good men whom I knew when they earned their way to college and through college, and who have worked through the service of the assistant with unfailing credit in the best of establishments, and who have set up for themselves in such a way as to gain for some years the best business to be had, tell me they find themselves at times barely able to hold their own in the struggle. Only this I can tell them, they may thank the advantages of college training for so much, that they can hold their own in the very hardest of seasons.

"I do not receive as much confidence from the men of other pursuits. I do not know as well the besetting difficulties of other lines of business. I do not try to compare the condition of pharmacy with that of other professions, or to give a young man any advice, whether he should choose pharmacy from among the pursuits or not.

"This much I can always say, and with emphasis, to any young man not yet in pharmacy. If you are going on without a good general education, surely not less than the best high school preparation, do not enter pharmacy. If you will not plan to give yourself the advantage of a thorough-going pharmacy school, do not take up the work of the drug store. Unless you can study effectually to be a pharmacist, turn toward something else. There are plenty of callings honorable enough without scholarship. At any rate, in the future, for those who have yet to begin, pharmacy will not be profitable without scholarship. Starting at this time in the century, it will not pay you to be an unlearned pharmacist. And if you are only just able to pass through an ordinary state board examination, pharmacy will not pay you as well as some other calling.

"And for the same reasons, let me say, pharmacy is a promising field to young men of intellectual industry. It is where the best scholarship counts the highest. To the young man of intellectual earnestness pharmacy is a most attractive profession. Very few successful students, within my observation, ever abandon pharmacy for other pursuits.

"It is the duty of the state to provide thorough pharmaceutical education. This requires no argument, to the people of Minnesota. It is a statement that hardly requires defense. Any argument against it is equally good as an argument against primary or grammar-school education at the public expense. The subject, however, is an inviting one, and to do justice to its merits would require an address in itself. Pharmacy is founded in the sciences, and the foundations of its schools should be the broadest and deepest of educational institutions. Pharmacy needs the libraries, the laboratories, the authorities of an university,—needs in greater part the same libraries, and the same laboratory appliances, and the same authority in science, which the other parts of the university must be provided with for their own demands. The university is the best home for pharmaceutical study."

Trademark and "Wortschutz".

In the interest of the chemical industry and the trade in its products, the discussion of a question which has caused quite a commotion in interested circles as well as in the legislative and executive branches of the government, may be justified. It is the question of the results of the law of May 12th, 1894, in regard to protection in the naming of articles, in which wordmarks are granted as exclusive privileges in the German Empire.

Seeing that numerous inconveniences would result if any interested person were allowed to monopolize a part of the general vocabulary, the legislator found it necessary to introduct of number of cautels. In consequence the conception of what constitutes a wordmark worthy of protection has become very vague. Since the enactment of the law there has been occasion for plenty of dispute, and the underlying principle is so illdefined that, since it cannot be replaced by a number of single exactments, it is a question whether the good has reached those for whom it was intended.

The wordmark seems to us an institution claiming legality on very uncertain ground between patent right and trade mark right.

The wordmark vests in a person the exclusive right to give a certain name of his own choice to an article. Like the patent right it is associated with one certain thing and therefore naturally it is considered as a sort of indirect patent right, or rather as a means of securing a right of exclusive use, which is not founded on the patent right and without the time limitations and the increasing expense connected with securing the latter.

The experience here seems to be as it always is when a principle rests on an unsound basis. While it is correct that the use of words taken from the general vocabulary cannot justly be granted to one person as an exclusive right, the consequence is that the most fantastic names are invented, from which no one can conjecture what article the name stands for. It seems to be putting a premium on burdening the language with monstrous and meaningless word-formations.

This surely cannot be entertained at a time when public and private efforts are directed to the purification of the language.

The system of the wordmark does not directly reward the producer but the trader. Unlike the patent right it fails to stimulate inventive activity, but aids the most commonplace and ridiculous advertising. It may ultimately benefit the inventor, yet it is always bad to try to accomplish a laudable object in such a questionable way.

It is easily understood how we have come to this. In our time the pursuit often has grown so hot, that it is full of prohibitory tendencies, while at the same time confessing loyality to the principle of liberality which is really a remnant of a time gone by. Hence the singular methods of obtaining privileged positions, which one does not dare to demand outright.

The conflict between rivaling tendencies is nowhere more apparent than in the British commercial policy, which, while formally adhering to the principle of free trade, loves to turn to measures that actually oppose it.

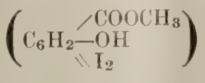
This was very apparent from the consequences which the commentators on the provisions of the law for the suppression of false marking attributed to it. It seems to us that with the acknowledgement of the advisability of the wordmark we will be introducing a large part of these tendencies here.

[Gehe and Co's Handelsber., April '96.]

Chemistry.

Sanoform.

This is the name given to a new antiseptic which is chemically the methyl ester of di-iodosalicylic acid,



$$\left(C_6H_2\begin{cases}COOCH_3\\OH\\I_2\end{cases}\right)$$

and is produced by the action of iodine on methyl salicylate. The new remedy contains 62.7% of iodine; it occurs as a finely crystalline powder, odorless and tasteless, soluble in 10 parts of hot alcohol, readily soluble in ether and in vaseline.

Its high melting point as well as its stability recommend its use in the manufacture of antiseptic gauzes, which can be sterilized without loss or decomposition. According to Longgard, sanoform is not poisonous, causes neither local nor general irritation, and being at least as active as iodoform is preferable on account of its lack of odor.

[Pharm. Centralbl., 1896, No. 21, p. 313.]

Fermentation of Uric Acid.

E. Gérard has been able to decompose uric acid into urea and ammonium carbonate by the action of micro-organisms. The acid was dissolved in a solution of sodium diphosphate, and the liquid exposed to the air. After four days exposure it was rendered turbid by micro-organisms that had been attracted, and the presence of free ammonia was indicated. Variations in the products of the biochemical action seemed to indicate that if the action were allowed to continue, the urea would in time probably be decomposed, and ammonium carbonate be the sole product.

[Pharm. Journ., 1896, p. 421; from Compt. rend. 122, p. 1019.]

New Synthesis of Urea.

P. Cazeneuve finds that the guaiacol carbonate of Heyden, in contact with alcohol saturated with ammonia gas, is converted rapidly in the cold into ordinary urea and guaiacol. As the crystals gradually dissolve in the liquid, the latter assumes a yellowish tint, and then becomes greenish, the process being accelerated by heating to 50° C. The urea is in long needles on evaporating the solution, and can be purified by recrystallization from alcohol.

[Pharm. Journ., 1896, p. 421; from Compt. rend., 122, p. 999.]

Origin of Argon and Helium in the Gas from Sulphuretted Waters.

According to Louis J. Troost and Léon V. R. Ouvard the gases extracted from the water of the Seine, and from sea water, contain argon, but only very feeble and often uncertain traces of helium. The gases from the sulphuretted waters of Canterets, on the other hand, contain helium in distinct and readily recognizable quantities. The authors are of the opinion that the helium is not derived from the atmosphere, but from minerals such as cleveite, bruggerite, monazite, etc., in the rocks through which the waters percolate.

Bouchard considers that although it may not be possible to attribute any special therapeutic action to the argon and helium present in the waters referred to, it is quite conceivable that compounds of them may be dissolved in the waters, and exert an important influence on their therapeutic effects.

[J. C. S., 70, p. 298; from Compt. rend., 121, p. 798; Bouchard, ibid., p. 800.]

Action of Alcohol on Mercurous Iodide.

Although alcohol is commonly employed in the preparation of mercurous iodide, it is not without action on it, especially when heated. As shown by Maurice Francois, alcohol decomposes the iodide into mercuric iodide and mercury, and the decomposition ceasing when the boiling alcohol of 95° contains 0.222 gram of mercuric iodide in 100 grams of the liquid. With a higher proportion, the solution acts on mercury and converts it into mercurous iodide until the limit is reached. 1000 grams of boiling alcohol of 95° will decompose about 3.15 grams of mercurous iodide; the alcohol commonly employed for washing mercurous iodide gradually decomposes it, removing mercuric iodide and leaving mercury; and the two iodides cannot be accurately separated by means of alcohol.

[J. C. S., 70, p. 301; from Compt. rend., 121, p. 888.]

Thiopyrophosphates.

Reference was recently made to the fact that M. Ferrand had prepared a number of thiophosphites, corresponding to the general formula M_3PS_3. He now describes another series of compounds corresponding to the formula $M_4P_2O_7$. Copper thiopyrophosphate, $Cu_4P_2S_7$, occurs in violet crystals which are red by transmitted light. Iron thiopyrophosphate, $Fe_2P_2S_7$, is in small crystalline lamellae; silver forms a yellow crystalline mass ($Ag_4P_2S_7$); nickel a dark-brown crystalline powder ($Ni_2P_2S_7$); chromium a black crystalline powder ($Cr_2P_2S_7$); zinc, small needles ($Zn_2P_2S_7$); cadmium, a white crystalline powder ($Cd_2P_2S_7$); mercury, a red crystalline powder ($Hg_4P_2S_7$); lead also forms a reddish crystalline powder ($Pb_2P_2S_7$); and aluminium, a mass of small white needles ($Al_2P_2S_7$). The compounds $Cu_2P_2S_7$ and $Hg_2P_2S_7$ have not so far been obtained. The nickel, chromium, zinc, mercury, and aluminium salts decompose readily in moist air or water; alkalies also attack some of the compounds, and acids practically all of them.

[Pharm. Journ., 1896, p. 421; from Comp. rend., 122, p. 886.]

Abstract from W. E. Stone's Report: A Year's Progress in the Field of Carbohydrates.

During the year 1895 the activity devoted to rerearch among the carbohydrates has in no wise abated, and although no results of a striking character have been obtained as compared with those of some recent years, there has been evident progress toward a more definite and scientific knowledge of these bodies.

The most important general reaction of sugars brought out during the year is the so-called glucoside synthesis discovered by Fischer and his pupils. Although the reaction was noted in development in 1894, its perfected form has been announced during the last year. Ether-like compounds between the sugars and a considerable number of alcohols are made by mixing the constituents and subjecting them to the action of a very small amount of hydrochloric acid.

New Carbohydrates:—The substance volemite, mentioned by Bourquelot as being obtained from the fungus *Lactarius volemus* is identified by Fischer as a heptavalent alcohol or heptite, $C_7H_{16}O_7$, which by mild oxidation is converted into heptose.[1] This differs from the synthetic gluco- and gala-heptites and constitutes the second known natural heptite.

A substance has been obtained from young rye plants which is soluble in water with a specific rotation of $(\alpha)_D = 28°.9$, and easily converted into levulose. The name of β-levulose, or preferably secalose, has been assigned to it.[2]

The sugar agavose, from the *Agave Americana*, has been shown to be sucrose.[3]

By acting on amygdalin with the yeast enzyme which converts maltose into dextrose, it is found that one-half of the theoretical amount of sugar is set free. There remains a new substance, which upon hydrolysis with hydrochloric acid, breaks up into benzaldehyde, prussic acid and a second molecule of dextrose.[4] This would indicate that amygdalin contains a maltose molecule, one-half of which can be split off without affecting the glucoside structure.

The physiological aspects of the pentoses and pentosans still attract attention. Sixty-five percent of the pentosans in fodder was digested by sheep and fifty-three percent by rabbits. That portion digested did not seem to be assimilated, since pentoses constantly appeared in the urine of the animals.[5] Pentoses are frequently noted in urine and the phenomenon is the excuse for a new term "pentosurie."[6] This occurence does not accompany diabetes and is not to be regarded as an alarming condition.[7]

Dextrose has been obtained by the hydrolysis of cocoanut shells,[8] and from sumach (*Rhus*).[9] The sugar obtained from indican, either by hydrolysis or ferments is dextrose.[10]

Levulose has been prepared from orange peel.[11]

Galactose has been obtained from the gum of *Acacia decurrens*, which probably contains a galacto-araban complex capable of hydrolysis.[12] Compounds of galactose with alcohols and phloroglucin have been noted.

Sucrose.—As the result of rather extended observations by himself and his pupils, Schulze regards sucrose as a form of reserve food in the plant, derived probably from starch of which it is a transport form.[13] Of interest are the recorded occurrences of sucrose in seeds and plants from which it has been separated by the strontian method. Among seeds containing sucrose, are noted oats, rye, wheat, buckwheat, ripe and unripe peas, soja bean, peanut, hemp, sunflower, coffee and lupine; sucrose is found in etiolated germinating plants of lupine, sunflower, vetch and potato; in green plants of rye, vetch, potato, elder and hazel; in tubers of potato and roots of the carrot and in the flowering buds of the pear.

It has been claimed that citric acid is produced when sucrose is oxidized by potassium permanganate, but this has been vigorously denied by several experimenters who at least have been unable to obtain the results described.[14]

Amorphous Carbohydrates: — An amorphous substance extracted from *Polyporous betulinus* has been named paraisodextran. Its formula is $C_6H_{10}O_5$, and by hydrolysis it yields dextrose.[15]

The pectins are regarded by Tollens as being closely related to the carbohydrates as chiefly indicated by their hydrolytic products. It is pointed out that they are of an acid character, as shown by their solubility in alkalies. It is probable that they contain the carboxyl group, COOH, and that they are oxy-derivatives of the mucous bodies.[16]

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[1] E. Fischer. Ber., 28, p. 1973.

[2] Schulze and Frankfurt, Ibid., 27, p. 3525.

[3] Stone and Lotz. Am. Chem. Journ., 17, p. 368.

[4] E. Fischer, Ber. d. chem. Ges., 28, p. 1508.

[5] H. Weiske, Ztschr. physiolog. Chem., 20, p. 489.

[6] E. Salkowski, Berl. Klin. Woch. Schr., 32, p. 364.

[7] F. Blumenthal, Ibid., 32, p. 567.

[8] Tollens and Tromp de Hass, Ann. Chem. (Liebig), 286, p. 386.

[9] C. Böttinger, Archiv. f. Pharm., 233, p. 125.

[10] C. J. van Bookeren, Landw. Versuch Stat., 45, p. 195.

[11] R. W. Bauer, Landw. Versuch. Stat., 45, p. 293.

[12] W. E. Stone, this journal, 17, p. 196.

[13] E. Schulze and S. Frankfurt, Ztschr. physiolog. Chem., 20, p. 511.

[14] T. Phipson, Chem. News, 71, p. 296; also 72, p. 31, 100, 165, 190, 235, 268.

[15] E. Winterstein, Ber., 28, p. 774.

Cellulose.—The researches of Cross, Bevan and their associates, upon cellulose, are among the most interesting of those of recent date on the carbohydrates, especially in view of their technical application.[17]

The general results of these investigations go to show that cellulose, in the general sense, or the fibers of plants are not at all of homogeneous character. The different constituents of cellulose are distinguished by their resistence to or behavior toward certain reagents. Typical cellulose is a polyhydroxylated body, forming a variety of compounds with acids and alkalies, such as alkali-cellulose-xanthate, acetyl, benzoyl and nitrated compounds.

Compound celluloses or ligno-celluloses, found in plant fibers, are regarded as more or less oxidized derivatives of pure cellulose. These latter are unstable and tend to form cyclic compounds, such as furfurol, lignone, and keto-R-hexene bodies.

[Am. Chem. Journ., 19, p. 504.]

Action of Ferments and Enzymes on Carbohydrates.

In his report on the year's progress in the field of carbohydrates, W. E. Stone reviews the work done under this chapter as follows:

Increased attention has been given to the action of yeasts and enzymes upon sugars. It appears that many of these agents act selectively, inverting certain sugars and not affecting others.[1] Ordinary beer yeast yields a soluble substance, which inverts both sucrose and maltose. A similar extract from the "kefir" yeast inverts lactose. An extract from *Schizo-saccharomyces octosporus* completely inverts maltose, but is without effect on sucrose. From *S. maximus* was obtained an enzyme with exactly the opposite property of inverting sucrose, and not maltose. These enzymes receive the names of invertin and maltase. *Monilia candida* contains maltase, but not invertin. It is well known that different species of yeast are of quite different fermenting powers, and this is doubtless due to their specific enzymes.

Melibiose, resulting from the partial decomposition of raffinose is not affected by invertin from ordinary yeast.[2] This is proposed as a means of estimating raffinose, solutions containing the same to be inverted by invertin, leaving the melibiose unchanged.[3] Maltose behaves differently towards the invertin of yeast and the glycase of grains.[4]

Fischer shows in an interesting way that the action of enzymes on sugars is modified by the configuration of the latter.[5] For instance, only those glucosides which contain the dextrose molecule are susceptible to the yeast enzyme. Emulsin, however, acts upon glucosides containing either the dextrose or galactose molecule. Only the so-called β-galactosides were so decomposed, and since lactose shows the same relation, it is regarded as having a similar constitution. The methyl derivatives of gluco-heptose, rhamnose, arabinose and xylose are not so affected, and it is noticeable that they all belong to the "*d*-dextrose" series. These data will also throw light upon the constitution of the di-saccharides. For the three best known of this group, sucrose, lactose and maltose, exist specific enzymes, invertin, maltase and lactase. The behavior of the less definitely studied di-saccharides toward these enzymes will establish their relationship to one or the other of those whose structure is to some extent known.

[Am. Chem. Journ., 19, p. 513.]

Botany and Pharmacognosy.

Glucoside in Monotropa.

E. Bourquelot has previously shown that methylsalicylic ether can be extracted from several species of *Polygala* and also from *Monotropa hypopitys*, but he was of the opinion that the compound did not naturally exist in the plants, and has now been able to prove that it is formed in the case of *Monotropa* from a glucoside existing in that plant. The glucoside is accompanied by a ferment capable of decomposing it, and the same ferment has been found in all the plants yielding methylsalicylic ether. After commenting on the work of Procter, who found, in the bark of *Betula Cuta*, a glucoside, gaultherin, and a soluble ferment capable of giving rise to methylsalicylic ether, and that of Schneegans and Gerock, who isolated the glucoside in crystalline form, the author sums up the facts as follows:—

1. There is a soluble ferment capable of hydrolizing gaultherin in the roots of *Spiraea almaria*, *S. filipendula*, *S. salicifolia*, and *Polygala sp.*, in the bark of *Betula Cuta*, the leaves and fruits of *Gaultheria procumbens*, and the petals of *Agalea sp.*;
2. In *Monotropa hypopitys* there exists a glucoside which can be hydrolized by the same ferment, and is, therefore, probably identical with gaultherin;
3. Neither gaultherin nor the glucoside of *Monotropa* can be hydrolized by any other known ferment.

Schneegans has recently suggested the name "betulase" for the ferment discovered by Procter, but Bourquelot prefers "gaultherase," as recalling the glucoside upon which it acts.

[Pharm. Journ., 1896, p. 421; from Compt. rend., 122, p. 1002.]

Opium Imports at Kiungchow.

According to the latest Consular Report the amount of the opium imported by steamer during 1895 is larger than in 1894, the value being £23,702 for the latter year and £27,389 for 1895. By far the largest quantity of the drug is, however, imported by junk in order to evade the heavy customs and "likin" levies. The value of the import by steamers in 1886 the year before the Opium Convention came into force, was £171,100, and it has diminished every year since then until the one under review, the value in 1894 being only £23,702. The rise in price of the Indian drug accounts partly for the small import in 1894, but practically the diminution is due to the success with which smuggling junks evade the cruisers sent to protect the revenue. It is calculated that about 1000 chests find their way to the island every year without paying the legal duty. Only two captures were made by the cruisers during the year, amounting together to some 33 chests. The importation of native opium is said to be on the increase in consequence of the rise in price of the Indian drug.

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[16] Tollens and Tromp de Haas, Ann. Chem. (Liebig), 286, p. 278.

[17] Cellulose, by Cross and Bevan; Longmans, Green & Co., 1895.

[1] E. Fischer and P. Lindner, Ber. d. chem. Ges., 28, p. 984.

[2] Ibid., p. 3034.

[3] A. Bau, Chem. Zeit., 18, p. 1794.

[4] C. Lintner and E. Kröber, Ber. d. chem. Ges., 28, p. 1050.

[5] Ibid., 28, p. 1429.

Criminal Poisoning in Hong Kong.

A lecture on this subject was given at Hong Kong last month before the Odd Volumes, by Mr. W. E. Crow, Pharmaceutical Chemist and Government Analyst. He confined his remarks for the most part to poisonous agents concerning the use of which, in the colony of Hong Kong, authentic records are in existence. So far as the Chinese are concerned opium in the form of aqueous extract is the only poison used by suicides. Other poisons used for grave offences are but few in number, the chief being aconite, arsenic, *Datura alba*, Nees, and *Gelsemium elegans*. The Chinese know white arsenic as Pak-Sun-Shek, realgar is Hung-Nong, orpiment is Tsz-Nong, and a mineral containing arsenic oxide and sulphides is known as Hung-Sun. Aconite root from various species is indifferently termed Ts' ó ù, the root of *Gelsemium elegans* is sold under the name of ú mun kéung, while in South China the plant is commonly termed tün ch'eung ts'′o, and the datura plant is known as Nun Yeung Fa. Fish have been poisoned by the seeds, freed from oil, of *Camellia oleifera*, Ch'à tsai ping, or Ch'à fu. With regard to the importation of morphine into China, Mr. Crow expressed the opinion that China, through her foreign customs, can effectually stop the traffic if she wills it.

[Pharm. Journ., 1896, p. 433.]

Another Arrow Poison.

As the result of an investigation of an arrow poison used by the natives of the Philippine Islands, Carl Gärtner has come to the conclusion that the fatal action is due to a direct effect on the ganglia of the heart itself. This is not the first arrow poison found to act in this manner; the substance called Dajaksch used in Borneo, also a similar substance known as Upas autiar belong to this class.

This new poison is obtained by extraction with water from the bark of a tree called by the natives, Abuhab, known to science as *Rabalaisia philippinensis*, of the Euphorbia family.

The solution used in the experiments contained in 10 ccm. the active principle extracted from one gram of the comminuted bark. The hypodermic injection of 0.1 ccm. of this fluid was fatal to frogs; a dose of 0.3 ccm. resulted in death after 56 minutes. When 0.5 ccm. was administered, a remarkable result followed. The death of the heart took place in 8 minutes, whereas, breathing, muscular reaction to mechanical irritation and voluntary muscular movements were still seen. The heart was killed and the remainder of the organism was, for the time being, as yet unaffected. The author remarks that, had the frog not been opened to allow observation of the heart's action directly, the animal for hours would have given no evidence externally discernable of the death of the heart. In view of the well-known temporary mutual independence of heart and of body in the frog, this seems not at all a rash statement.

The minimal fatal dose administered hypodermically to rabbits was found to be 0.4 ccm. per kilogram. The general weakness and the spasmodic struggles here seen were regarded as merely secondary results following the interference with the heart's action.

[Beobachtungen über die physiologische Wirkung eines neuen Pfeilgiftes, etc. Inaugural Dissertation, Erlangen, 1895.]

Behavior of Caffeïne and Theobromine in the Organism.

The administration of large doses of caffeïne to dogs as demonstrated by Manfredi Albanen, is followed by greatly increased secretion of urine, from which a monomethyl-xanthine, $C_6H_6N_4O_2$, probably identical with that obtained by Solomon (Abstr. 1886, 266), may be separated. A dose of 1 gram of methyl-xanthine administered hypodermically to a dog weighing 8 kilos caused death in 10 days; in smaller doses, it acts as a diuretic and must be considered as an intermediate product in the transformation which caffeïne undergoes in the organism, for very little of it is excreted when hypodermically injected. After the administration of caffeïne in the food of a dog, small traces of it can be extracted from the urine.

Xanthine is not a normal constituent of the urine of rabbits; after administering caffeïne, the urine contains small quantities of caffeïne but no methyl-xanthine. A dimethyl-xanthine, $C_7H_8N_4O_2$, and caffeïne can be separated from human urine after caffeïne has been taken internally.

It is thus evident that in its passage through the organism, methyl groups are removed one by one from caffeïne until xanthine is finally obtained, and converted into ammonia and urea.

Methyl-xanthine, injected into the jugular vein of rabbits, acts as a very powerful diuretic, the secretion of urine being increased to more than 40 times the normal.

Theobromine, when administered internally to dogs behaves like caffeïne; small quantities of it are excreted, and a larger proportion appears in the urine as methyl-xanthine.

[J. C. S., 70, p. 319; from Gazzetta, 25, ii, p. 298.]

Practical Pharmacy.

Capsules and Pills intended for solution in the intestines.

Several processes have recently been patented for the manufacture of the above. The process of C. F. Hausmann (St. Gallen, Switzerland) consists in placing gelatin capsules, after filling in the usual manner, into a 0.8% solution of formic aldehyde for 18 minutes, washing with water and drying at 50° C., whereby they are so changed as to become insoluble in the juices of the stomach, but are readily dissolved by the pancreatic ferment of the small intestines. The results of Weyland (Therap. Monatsh., Heft 3, 1896) showed that the solubility of the gelatine depended upon the concentration of the formic aldehyde solution, and upon the time of maceration. When carefully prepared, the gelatin had the following properties: It was insoluble in water at 38° C. but was dissolved by the prolonged action of boiling water. In artificial gastric juice the hardened gelatin is very difficultly soluble, 10—12 hours being required; ox-gall acts similarly. In artificial panreatic juice, the gelatin is dissolved in 1—2 hours whether previously macerated in gastric juice or not.

According to the same patent, gelatin capsules can also be hardened by maceration in potassium bichromate solution and subsequent bleaching, which treatment renders them insoluble in water.

The pills are coated as follows: Dissolve shellac in a solution of borax, evaporate to dryness, remove the excess of borax by lixiviating with alcohol and filtering, and evaporate the alcoholic solution. The glue-like residue, called keratoid, is again dissolved in alcohol and used for coating pills. After drying, the coated pills are agitated for two hours with 33% acetic acid and the whole process is repeated.

[Pharm. Centralh., 1896, p. 360.]

Estimation of Morphine in Opium.

For this determination, G. Looff employs sodium salicylate and benzol for the removal of resinous matter and of narcotine. He recommends the following method:

5.0 g. of finely powdered opium are rubbed up with 5 ccs. water, the mixture then diluted and rinsed into a tared flask, after which enough water is added to make the contents weigh 44 g. The flask is then stoppered and agitated for 15 minutes when 1 g. of sodium salicylate is added, the mixture shaken a few minutes longer and filtered. 25.8 g. of the filtrate (corresponding to 3 g. of opium), are treated with 3 g. of ether and 1 g. water of ammonia and thoroughly shaken for 10 minutes. The morphine that separates out is collected on a small smooth filter and the flask rinsed twice with 5 ccs. of water, and the rinsings added to the filter. After drying on the filter, the morphine is washed with benzol, again dried, and weighed.

When rubbing up the opium with water, the author recommends trituration with little pressure, as otherwise the opium is liable to pack. [Ap. Ztg., 1896, p. 192.]

Creasote Pills.

One of the most difficult pill-masses to make is that of creasote, especially when large quantities of creasote are prescribed. A large number of formulas have already been published in pharmaceutical journals for the manufacture of these pills, the most important of which will be here recapitulated:

1. With magnesium oxide, yellow wax and cacao butter. 2. With potassium bicarbonate and ext. of liquorice. 3. With glycerin, althea root, liquorice root, and mucilage of tragacanth. 4. With ext. of liquorice, glycerin, and powd. liquorice. In the supplement to the German "Arzneibuch," the following is found: Creasote 10.0, Pulv. rad. liquirit. 19.0, Glycerin 1.0.

After a thorough test of the above methods, S. Kathrein found none to be thoroughly satisfactory. A mass that can be rapidly mixed and is satisfactory in every respect, can be prepared as follows:

℞. Kreasoti e fago 10.0.
Pulv. rad. Liq. 20.0.
Album. ovi. rec. q, s. (5.0).

M. f. l. a. massa pil., e qua forment. pil., No. 100. Each pill contains 0.1 g. creasote.

[Zeit. d. all. öster. Apoth. Ver., 1898, p. 232.]

Literary.

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Eduard Besold—Leipzig. Guide for the use of doctors and apothecaries. English-German. By Gisbert von Sudthausen. One Vol., pp. 135.

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Reviews.

Analytische Chemie für Apotheker. Bearbeitet von Dr. Heinrich Beckurts, Professor an der Herzogl. Techn. Hochschule zu Braunschweig. Verlag von Ferdinand Enke, Stuttgart. Ein Bd., pp. IV, 466. Mit 80 Holzschnitten und 2 farbigen Tafeln. 1896. M. 10.00.

When Liebig gave his attention to and wrote about agricultural chemistry, the chemistry of his subject was uppermost in his mind. To-day the same term is sometimes used to cover work to which there is little if any chemistry. In pharmacy we, likewise, have a-b-c-books on chemistry that sail under the presumptious name of pharmaceutical etc. chemistry, or monographic treatises on chemical subjects of interest to the pharmacist, with rather poor chemistry. There is but one chemistry. It may be adapted to students who desire some general information of the natural sciences, or to those who desire to become teachers of chemistry, or analytical chemists, or pharmacists, or physicians, etc., but in order to deserve its name it should be a philosophic exposition of the science. The same might be said of analytical chemistry and its applications.

A book that introduces itself as Analytical Chemistry for Apothecaries, rather than as Pharmaceutical Analytical Chemistry, makes a favorable impression at first sight. In this particular case the good impression stays as one cuts the pages to become more familiar with the contents and methods of treatment. The author does not pretend to bring anything new that cannot be found in other text-books of analytical chemistry, but merely claims to have carefully considered the interests of the pharmaceutical student in selecting the experiments.

An enumeration of the table of contents will give the reader a good idea of the scope of the book:—

I. Reactions of inorganic substances.
II. Reactions of organic substances.
III. Course of qualitative analysis.
IV. Gravimetric analysis.
V. Volumetric analysis.
VI. Toxicological-chemical examinations.
VII. Medico-chemical examinations.
VIII. Testing and assay of drugs.
IX. Examination of foodstuffs, beverages, air, water, etc.
X. Instruments and apparatus.
XI. Tables and index.

The book is comprehensive in its scope and a faithful student with good preparation is supposed to be able to master its contents in a year and a half to two years working in the laboratory daily.

The pharmacist of to-day makes but few of his galenical preparations and probably none of his chemicals. It is, therefore, all the more important that he should be a thorough master of chemistry and chemical analysis in order that he may ascertain for himself the quality of the chemicals and preparations he purchases, and may assume personal responsibility for what he dispenses. This is the *raison d'être* of the modern pharmacist. *E. K.*

Review of American Chemical Research. Reprint from Technology Quarterly, Vol. VIII, No. 4. Edited by Arthur A. Noyes. Pamphlet, pp. 52.

American chemists have been at a disadvantage in having their literature distributed over a comparatively large number of journals, not all of which were by any means strictly chemical publications.

The Technology Quarterly during the past year published a Review of American Chemical Research. This review, prepared by members of the instructing staff of the Massachusetts Institute of Technology, will hereafter be also published as a separate volume. The abstracts are classified into the following groups:—

General and Physical Chemistry.
Inorganic Chemistry.
Analytical Chemistry.
Proximate and Technical Analysis.
Geological and Mineralogical Chemistry.
Organic Chemistry.
Technical Chemistry.
Biological Chemistry.
Metallurgical Chemistry and Assaying.
Apparatus.

The work accomplished thus far is very creditable to the editor and his associates. No doubt it will gain in completeness as it progresses and will give Europeans a much better idea of the work done on this side of the Atlantic. *E. K.*

A Dictionary of Chemical Solubilities Inorganic. By Dr. Arthur Comey, formerly Professor of Chemistry, Tufts College. Macmillan and Co., New York. One vol., pp. IX, 515. 1896. $5.00.

Among the principal literary needs of the modern chemical laboratory an up-to-date dictionary of chemical solubilities was one of the most important. The modern chemical laboratory is equipped with almost every imaginable mechanical contrivance to facilitate work. The literary facilities of such laboratories are not always equally well provided for. The Dictionary of Chemical Solubilities of inorganic substances by Prof. Comey will make good one of these deficiencies.

In the preface the author gives a brief yet interesting account of the evolution of the dictionary of solubilities. The explanatory preface gives directions for the use of the work, since, in order to use a dictionary for ready reference, it is necessary to know according to what principle the items are arranged. A list of abbreviations and references follows. The appendix contains tables of formulas for converting areometer degrees into specific gravity and a synchronistic table of chemical and other scientific periodicals.

The large body of the text is taken up by the dictionary proper. Beginning with air and ending with zirconyl sulphide the inorganic chemicals, including a small number of carbon compounds usually classed with the inorganic, are arranged in alphabetical order.

That the work previous to 1850 should have been included, even when only of historical value, is to be considered an advantage rather than a disadvantage. A monographic treatise of this kind cannot afford to omit facts that have historic value, simply because some "practical chemists" may have no use for such data.

The work appears to be thoroughly done. A sufficient variety of type has been used to make ready reference easy. The numerous tables of solubility constitute a valuable addition to the text. The character of the bookwork of the publishers is too well known to require any comment. *E. K.*

Guide for the use of doctors and apothecaries. English-German. By Gisbert von Sudthausen. Eduard Besold, Leipzig. One vol., pp. 135.

Sprachführer für die ärztliche und pharmaceutische Praxis. Deutsch-Englisch. Von Gisbert von Sudthausen. Eduard Besold, Leipzig. Ein Bd., pp. 133.

These companion volumes are intended primarily for German-English or German-American physicians and pharmacists who are not familiar with the colloquial equivalents of technical terms. They may, however, be of almost equal use to the American or English pharmacist with German-speaking patrons. The greater part of the work is made up of tables of equivalent terms, classified under such headings as The human body, Diseases, Dressings, Bandages and hospital conveyances, The city, English money, American money, Weights and measures, Medicaments, Retail articles, Surgical instruments, etc. This is followed by a brief general vocabulary of verbs and nouns most likely to be needed by the physician or apothecary, and by a dictionary of phrases arranged under conspicuous words. Tables of comparison of thermometers and of linear measure are given at the end. In every case the pronunciation of the English term is indicated in German letters.

The matter in the two volumes is practically the same, the terms in each list being arranged alphabetically, in one case according to the English, in the other according to the German. The translations are, on the whole, idiomatic and well-chosen. The regular use of "the" before all words where the article is used in German might be misleading: as, "the indigestion", "the swollen feet". Among the phrases are a few Briticisms which might amuse an American customer: as, "a nasty cough", "stopping a tooth with gold". In most cases, however, the work may be trusted implicitly.

William B. Cairns.

Jahrbuch der Naturwissenschaften 1895-1896. Enthaltend die hervorragensten Fortschritte auf den Gebieten: Physik, Chemie und chemische Technologie; angewandte Mechanik; Meteorologie und physikalische Geographie; Astronomie und mathematische Geographie; Zoologie und Botanik; Forst- und Landwirthschaft; Mineralogie und Geologie; Anthropologie, Ethnologie und Urgeschichte; Gesundheitspflege, Medizin und Physiologie; Länder- und Völkerkunde; Handel, Industrie und Verkehr. Elfter Jahrgang. Unter Mitwirkung von Fachmännern. Herausgegeben von Dr. Max Wildermann. Herdersche Verlagsbuchhandlung, Freiburg im Breisgau. Ein Bd., pp. XIII, 560. Mit 61 in den Text gedruckten Abbildungen, 2 Kärtchen und einem Separatbild. 1896. $2.00.

The title page of this volume is sufficiently complete to serve, for the purposes of review, as a table of contents. The few chapters not enumerated above are those on the 67th session of the Gesellschaft deutscher Naturforscher und Aerzte zu Lübeck (1895); a preliminary communication of the Madrid meteor; the heavens visible in central Europe; and the Totenbuch, the book of the dead.

The writer has twice (pp. 69 and 142) had occasion during this year to review pharmaceutical year-books. He pointed out that the complaint made by the publishers of one of these year-books, that so few pharmacists bought the respective year-book although the "entire professional press" recommended it, was probably due in part to the fact that it was nothing more than a catalogue of abstracts. Attention was also called to the fact that it is impossible for any one person to write a model year-book on a subject like pharmacy, which comprises such diversified branches of natural science.

Upon examination of the book before us we find that it is not compiled by one person, but that a number of persons have been entrusted with writing a year's report of that science or better those branches of science, of which they were supposed to be master. Furthermore the subject is treated in a more general manner. Abstracts on the same or similar subjects frequently have been brought under a somewhat general heading. The reader who desires to learn something about argon and helium will find a number of abstracts boiled down to a nine-page article on this interesting subject. The pharmacist desirous of learning something about the physiology and therapy of the thyroid gland will find a four-page chapter on this subject interesting and profitable reading. In this manner a large number of subjects, including even a seven-page article on bicycling, have been treated.

It becomes evident that the work is not intended for the specialist. It is not complete enough, nor does it go sufficiently into detail for his purposes. This year-book, however, seems admirably adapted to the needs of the scientific student and the professional man who desires a general information about the progress made in the natural sciences and the arts even after he has left college. The pharmacist, the physician, the highschool teacher and others are in need of just such information as is supplied by this year-book. To such as have a reading-knowledge of scientific German it can be strongly recommended.

E. K.

Medicinische Specialitäten. Eine Sammlung der meisten bis jetzt bekannten und untersuchten Geheimmittel und Specialitäten, mit Angabe ihrer Zusammensetzung nach den bewährtesten Chemikern. Von C. F. Karpaun-Karlowa. Dritte vermehrte, mit Einleitung und vollständigem Register versehene Auflage von Dr. pharm. Max von Waldheim. A. Hartleben's Verlag, Wien. Ein Bd., pp. 260, 1896. Geh. 1 fl., 80 kr., Eleg. geb., 2 fl., 25 kr.

As the author correctly says in the introduction to this work, the secret-remedy swindle is undoubtedly one of the great evils of the present day, and all possible means should be taken to better this unhealthy condition of affairs. Unfortunately, the public press, instead of co-operating with the better class of physicians and pharmacists in protecting the masses by enlightening them on this question, fosters the evil by opening its columns to the most audacious advertisements of remedies, accompanied by the often forged testimonials of patients and even physicians.

The object of books of the above kind is in part to expose the fraud of secret-remedies, so-called patent-medicines, by publishing their composition, and so showing the presence of injurious constituents, or the exorbitant prices charged for worthless material when the ingredients are harmless. With these motives the author has revised the work originally compiled by the late Capaun-Karlowa, and in its completed form gives an alphabetical list of over two thousand secret-remedies and specialties, together with their probable composition as determined by analysis. The compilation is made largely from the works of Hager and Jacobsen, the publications of the Karlsruh Board of Health, and from pharmaceutical journals. The large number of American "patent-medicines" included in the list makes the work of value to pharmacists of this country, as well as to those of Europe. The alphabetical index of names and synonyms which complete the work, enhances its value considerably as a book of reference.

Richard Fischer.

Pharmaceutical Review.

(Formerly **Pharmaceutische Rundschau.**)

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EDITED BY

DR. FREDERICK HOFFMANN AND **DR. EDWARD KREMERS.**

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ORIGINAL CONTRIBUTIONS.

Dr. Charles Otto Curtman.

By Prof. *Wm. Simon.*

There has been no university during the second quarter of the present century which gave such a strong impetus to, and was of such far-reaching influence upon the development of chemistry, as the one situated in the small city of Giessen, Germany. It was here that Justus von Liebig established the first chemical laboratory in the world devoted to the practical teaching of the science, and it was here that hundreds of young men gathered from all parts of the globe to receive instruction and inspiration from the great master. And these men went forth into the world, well equipped as apostles of the then comparatively new science, and through their teachings carried chemical knowledge and chemical investigation to all civilized nations.

Small, however, is to-day the number of those men who gathered around Liebig during the period mentioned; death has ended the life-work of most of them and again death has lately closed the eyes of one who was true to his science, and true to his task to the very last. Dr. Charles Otto Curtman is no more. On the morning of April 22, 1896 he passed away quietly and peacefully at his home in St. Louis, surrounded by his family and deeply mourned by thousands of friends.

Though efforts had been made to have the last ceremonies restricted to the presence of as few as possible, yet the funeral was one of the largest ever witnessed in St. Louis. People insisted on paying the last tribute to one whom they had loved and admired for so many years, to one who had become a dear friend to thousands.

Curtman was born July 30, 1829 in Giessen, where his father occupied a prominent position as Director of the Gymnasium, and was well known in educational circles as the author of a series of popular school text-books which were largely used throughout Germany for many years. The classic languages formed at that time the principal basis for the education in the Gymnasium, and that young Otto, as Curtman was called at home, became well drilled in Greek and Latin is best shown by the fact that even in late years he would pick up one of the old classics and enjoy reading a chapter from the Odyssey or from Cicero. But aside from this classical training Otto had the great advantage of growing up under the eyes of one who was a thorough educator of youth and who firmly planted in the mind of his son those qualities which are so essential to any scientist, viz: thoroughness in detail, logical reasoning in all matters, and love of science for its own sake.

A good foundation having thus been laid at home and in the Gymnasium and Realschule at Giessen (as also later in Offenbach to which town the father received a call) Curtman commenced the studies of chemistry and natural sciences at Giessen. Besides working in the chemical laboratory and listening to Liebig's fascinating lectures, he also attended those of Professor Henry Buff on physics, of Professor Hermann Hofmann on botany, of Professor Dieffenbach on mineralogy and of Professor Knapp (Liebig's brother-in-law) on chemical technology. To the last named he acted during the latter part of his university course as assistant, a distinction which was bestowed upon the most able of the many worthy applicants for the position.

After having finished his university studies Curtman became assistant to Professor Bromeis of the Polytechnic School at Hanau and was delegated from there to go to Antwerp, Belgium, with the view of introducing a new process for the manufacture of acetic acid.

It was during this stay at Antwerp that Curtman concluded, when but 20 years old, to come to the United States. One of the fast sailing Baltimore clippers landed him in New York in the fall of 1849, but he soon afterwards went to New Orleans where he engaged in the drug business, doing, however, also a considerable amount of chemical work in different directions.

When the civil war broke out Curtman first acted as army surgeon in a confederate cavalry regiment, but at the request of General Price soon established laboratories at Arkadelphia, Ark., and at Tyler and Marshall, Texas. In these establishments many kinds of chemical, pharmaceutical and pyrotechnical preparations were manufactured from the native supplies then available to the South. It was here that Curtman found for the first time ample opportunity to make good use of his knowledge, skill and ingenuity and some of the manufacturing processes which he introduced during that period are yet extensively used to this day.

At the close of the war Curtman lived for a short time in Memphis, but soon afterwards came to St. Louis, chiefly through the solicitation of Dr. Joseph Nash McDowell who invited him to cooperate in the reorganization of the Missouri Medical College.

Though Curtman had at that time a very fair knowledge of all, and a thorough knowledge of some branches of medicine, yet he had never taken a systematic course in that science, and he therefore set to work studying medicine, receiving his degree of M. D. in the proper course of time. Thoroughness being his aim in all undertakings, Curtman's knowledge in all of the medical branches became such as to compare favorably with that of specialists. Giving always preference to exact sciences, which permit of proof by experiment or by demonstration, anatomy became his favorite science and for many years he would carefully dissect a body each winter. Such was his knowledge that he pointed out years ago inaccuracies in Gray's Anatomy, which errors have since been corrected in the text-books.

Though Curtman practiced medicine for a number of years after the war, and though he was most successful as practitioner, yet he never liked this work and concluded to devote his life to other tasks more congenial to his taste. But although he made known that he no longer would practice, and although he raised his fees considerably in order to prevent people from calling upon him, yet such was his personal magnetism that some of his friends insisted on getting his medical advice as long as he lived.

The proper fields of labor which Curtman loved were chiefly scientific investigation and teaching. To these he devoted the last twenty-five years of his life while occupying the position of Professor of Chemistry in the Missouri Medical College, and for a number of years also in the St. Louis College of Pharmacy. In order to appreciate fully the work done by Curtman it may be well to consider him separately as scientist, as teacher and as man.

Curtman as scientist. Good, thorough training of the mind, skill in experimenting, the gift to observe accurately, the power to interpret phenomena correctly, never failing patience, indefatigable working capacity, tenacity of purpose, and finally, enthusiasm for the science and love for all nature — these are the qualities which make the true natural scientist; and all these qualities Curtman possessed in a high degree.

In order to satisfy his scientific longings he surrounded himself at home with the means of pursuing his studies and his experimental work. The rooms in the upper story of his house were devoted entirely to this purpose, and, though rather modest in size and very plainly furnished, they contained many rare treasures as also all the apparatus required to do chemical, microscopical, bacteriological and photographic work. There were besides the library of books of reference, fine collections of minerals, of rare chemicals, of photographic slides and of many other interesting specimens. The microscope was one of the best to be had, the chemical outfit was complete for the purpose required, and on entering the rooms one was surprised how so much material could be crowded together in so small a space, and yet leave ready access to each article and leave sufficient room to do both experimental and literary work. Yet it was this very plain scientific work-shop from which went forth into the world the results of many an investigation and the writings of an able author.

Curtman's earlier contributions to literature are widely scattered through medical, chemical and pharmaceutical journals, but of late he used chiefly the Pharmaceutische Rundschau for his publications. Through the volumes of this journal from the year 1885 to '95 are scattered some 50 articles on different subjects. Some of them are largely critical reviews of work done by others, but containing in most cases more or less of new matter based on personal observation and investigation. The field covered by these articles is chiefly that of analytical chemistry as applied either to official preparations, or to substances of interest from a physiological, toxicological or sanitary point of view.

As belonging to the first group of papers may be mentioned his articles on quinine sulphate, cocaine, pyrogallol, salicylic acid, ethyl nitrite, amyl nitrite, phosphoric acid, strontium salts, hydrogen peroxide, iodine and iodides, bromides, lead subacetate, bismuth subnitrate, arsenic tests, etc. Of sanitary or physiological subjects investigated by Curtman and reported on in the Rundschau we find papers on drinking water, milk, wine, blood, urine, etc. There are also articles on the use of the spectroscope, on microscopic examination of hair for medico-legal purposes, on pharmaceutical education, on an improvement in the graduation of pipettes and on several other subjects.

This partial enumeration of Curtman's contributions to the Rundschau during the last ten years may serve to show his great activity and the wide extent of the field in which he labored.

Many of the articles mentioned above are the outgrowth of his work done as a member of the revision of the U. S. Pharmacopœia of 1890. The task of revising the text of inorganic preparations and of the reagents and analytical methods was assigned to Prof. Curtman and Dr. F. B. Power. How excellently this subcommittee did its work is well known to scientists at home and abroad, but only the members of the Pharmacopœia committee and a few other scientists who participated in the work by invitation know how much labor, how much painstaking care was bestowed upon the task by this subcommittee during three years. In commencing the revision Curtman and Power divided the work between them, and then each started independently on his subject. As work progressed, reports were forwarded to the chairman, Dr. Charles Rice, who had them copied and sent for criticism to those participating in the work. These criticisms were made by the two chief participants, Curtman and Power, in the most scientific and most thorough manner. A single statement, yes even an expression, caused in many cases a scientific controversy extending over dozens of pages of the most interesting reading matter; both parties substantiating their views by references to authorities as well as by scientific proofs. These voluminous reports which form the intellectual battleground of two very able scientists contain a mass of information of official inorganic preparations and are a most valuable source of references to chemists generally and to future committees of Pharmacopœia revisions especially.

Dr. Curtman desired a suitable guide to laboratory work for his students, and not finding such a book in the English language, he was led to translate Dr. F. Beilstein's lessons in qualitative chemical analysis. The first edition of this work appeared in 1883, a second in 1886, a third in 1889 and a fourth in 1894. While the first edition was chiefly a translation of the German volume, each subsequent edition contained more and more of original matter, and the last one is practically Curtman's own work in which are yet incorporated Beilstein's lessons, but even these are greatly changed and modified. The very fact that this book appeared in four editions within ten years is ample proof of its adaptability to the purposes for which it was written. It is to be hoped that arrangements will be made to keep this extremely useful book in the market and have it properly revised from time to time by a competent teacher.

A second publication in book form by Curtman appeared in 1890 and bears the title: "Uses, tests for purity and preparation of chemical reagents, employed in qualitative, quantitative, volumetric, gravimetric, microscopic and petrographic analysis, with a supplement on the use of the spectroscope." In this most valuable little volume of 256 pages Curtman brought together for the first time matter that was heretofore largely scattered through the chemical literature of the world. This matter was properly sifted and systematically arranged, all doubtful statements were experimentally investigated and thus a work was created which serves today to chemists as by far the best guide in existence for any information regarding chemical reagents.

Before leaving Curtman's scientific career it may be stated that he was fellow of the American Association for the Advancement of Science, also an active and influential member of a number of medical, chemical, and pharmaceutical societies, the annual proceedings of which contain many of his papers read on different occasions. He also was a popular and much admired lecturer before mixed audiences and it was but a few weeks before his death that he delivered a lecture on the Roentgen X-rays, illustrating his subject by numerous experiments, and showing photographs taken by himself.

Chas O Curtman, M.D.

Curtman as teacher. The power to impart knowledge to others is a peculiar gift, and this power Curtman possessed to a very remarkable degree. To some extent he may have inherited this gift from his father, but it was largely due to a combination of those rare qualities which make the true teacher. Among these should be mentioned simplicity of the language used, clearness of the statements presented, the power to convince the listener of the truth or the reality of whatever is brought before him, enthusiasm for the subject under consideration, good judgment of the grasping capacity of the listener's mind, willingness to assist the student in his task, readiness to answer questions even when ridiculous, above all, however, a profound earnestness in the object of transferring his own thoughts, his own knowledge, into the minds of others.

And in addition to these qualifications Curtman was an excellent experimenter. His physical and chemical apparatus for illustrating his lectures was very complete and always in good condition. He never failed to bestow a great deal of care upon the proper arrangement of the apparatus required for each lecture, well knowing how much depends on the successfully rendered experiment in emphasizing a statement made.

In his laboratory instruction Curtman was extremely painstaking, never becoming tired or irritated when he had to explain certain facts over and over again. He was one of the first teachers, if not the first, who selected a raised platform in the laboratory as the proper place from which to give the demonstrations which were to be immediatly repeated by the students, the elevated position giving the teacher an opportunity to overlook the work done by each member of the class and to direct the assistants to those places where students failed to obtain the desired result.

Well knowing how fully students appreciate cordiality shown them by a teacher, Curtman never failed to exchange friendly words with his pupils or to show them his cordial feelings. Thus he repeatedly arranged matters so as to give his class, while doing volumetric work, a treat on the last day before Christmas holidays. For this purpose he had some large bottles filled with white and red wines, the acidity of which had to be determined volumetrically. The remaining portions, however, were subjected to physiological experiments on those present, while speech-making and merriment were going on. Incidents of this kind helped greatly to endear the professor of chemistry to the student.

If we finally take into consideration that Curtman's nature was of such a kind that he could not help introducing wit and humor into his lectures as well as into his laboratory instruction, it may be readily understood that Curtman was the great favorite with the boys, that they admired him, that they looked upon him not only as a superior teacher of chemistry, but also as a wise counselor in many other directions, and lastly as a dear old friend. Curtman as a teacher will never be forgotten by any of his students.

Curtman as man. No one who came in contact with Curtman, even for a short time, was likely to forget him in after years. His strong and positive personality, his tall and commanding figure, his powerful head crowned by a broad and well shaped forehead, the long white beard, above all, however, the charm of those kindly-looking blue eyes, sparkling with an intellectual radiance, these made on every one a favorable and lasting impression. And this impression was surely not diminished by conversation, of which he was master, leading it with ease from one subject to another, always speaking interestingly and never failing to intersperse it with clever witticisms or humorous remarks.

Curtman was extremely good-natured, as also very modest and unassuming, always preferring to remain in the background unless pushed forward by circumstances or by his friends. That he had hosts of these is but too natural and though leading a very busy life he not only found ample time for social intercourse, but also for regular correspondence with distant friends.

And what a boon to the reader were those letters which reflected so fully the greatness of the writer's busy mind as well as his good-nature and his sense for the ridiculous and humorous. When writing in a lighter vein he was extremely fond of interspersing his letters with most appropriate puns, or often with Greek and Latin quotations or sentences. When writing on serious subjects one could feel that every word was well considered and that every sentence had full weight.

While one of the most companionable of men there was one class of people he would have nothing to do with, and these were the men with shallow mind and superficial knowledge pretending to be more than they really were. For such men he had no pity and did not hesitate to expose them, while on the other hand he showed great consideration for those who were honest in their efforts, though weak in power.

Curtman was a man of great stability in his views and opinions, and he was practically immovable in his convictions unless sufficient evidence was brought forward to show him that he was in the wrong, when he readily accepted the situation.

In his home life Curtman was most happy, having selected for his companion through life a lady who was to him a true wife in the best and fullest meaning of the word. He had the satisfaction of seeing his children grow up to become useful members of society. Being naturally of a domestic nature his leisure hours were fully devoted to his family, by the members of which, in return, he was dearly loved and reverentially admired.

The loss of such a man as Curtman falls heavily not only on the immediate family and the thousands of friends, but also on the professions of medicine, chemistry and pharmacy. The world would be better off if we had more men like Curtman.

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The Periodides of the Alkaloids, as Molecular Forms for Volumetric or Gravimetric Estimation.*

By Dr. *Albert B. Prescott.*

Summary.

The results described in the preceding pages are presented in a condensed form in the subjoined table. In general terms, the perhalides, as given in the table, decrease in stability as we read from left to right. For example, of the periodides of the hydriodides, that of caffeine is the most stable—next comes that of bromocaffeine, and this is followed by the one of chlorocaffeine. The same is true of the periodides and perbromides of the other salts. While the line is quite sharp between the

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* Continued from p. 153.

		CAFFEINE.			BROMOCAFFEINE.			CHLOROCAFFEINE.		
	Acid combined with base.	Perhalides.	Stability.	M. P.	Perhalide.	Stability.	M. P.	Perhalide.	Stability.	M. P.
Periodides.	HI.	$C_8H_{10}N_4O_2.HI.I_2$		171°						
	HI.	$C_8H_{10}N_4O_2.HI.I_4$	*a*	215°	$C_8H_9BrN_4O_2.HI.I_4$	*a*	183°	$C_8H_9ClN_4O_2.HI.I$	*a*	185°
	HBr.	$C_8H_{10}N_4O_2.HBr.I_4$	*b*	183°	$C_8H_9BrN_4O_2.HBr.I_5$	*b*	160°	$C_8H_9ClN_4O_2.HBr.I_5$	*b*	169°
	HCl.	$C_8H_{10}N_4O_2.HCl.I_2$	*c*	165°	$C_8H_9BrN_4O_2.HCl.I_4$	*c*	133°	$C_8H_9ClN_4O_2.HCl.I_4$	*c*	137°
Perbromides.	HBr.	$C_8H_{10}N_4O_2.HBr.Br_2$		170°	$C_8H_9BrN_4O_2.HBr.Br$		206°	$C_8H_9ClN_4O_2.HBr.Br$		189°
	HBr.	$C_8H_{10}N_4O_2.HBr.Br_4$	*a*	170°	$C_8H_9BrN_4O_2.HBr.Br_5$	*a*	156°	$C_8H_9ClN_4O_2\text{-}HBr.Br_5$	*a*	151°
	HCl.	$C_8H_{10}N_4O_2.HBr.Br_4$	*b*	149°	$C_8H_9BrN_4O_2.HCl.Br_5$	*b*	157°	$C_8H_9ClN_4O_2.HCl.Br_5$	*b*	153°

perhalides of caffeine and those of bromocaffeine, it is not so between the perhalides of the latter and those of chlorocaffeine.

* * *

We can speak only in general terms of a difference in stability between the perhalides of the two halogen caffeines, respectively. Thus, we notice such a difference in stability between the periodides of the two hydrobromides, and also between the perbromides of the two hydrochlorides respectively. The gradation in stability among the periodides of one and the same class is usually, but not always, regular. In all three cases, however, the periodides of the hydriodides are far more stable than those of the other salts. If *a*, *b*, and *c* should represent different degrees of stability, decreasing in alphabetical order, then the relative stability of the members of each class of the perhalides is as is given in the table. It must be understood that the term stability is used here in its broad and general sense, such as the behavior of the compounds towards different solvents, and on exposure to air. The comparison is made between the perhalides of each class, and the periodides, as well as the perbromides of each of the three bases (caffeine, bromocaffeine, and chlorocaffeine) form separate classes for comparison. When two perhalides of the same salt exist, only the higher one is taken into account.

There appears to be a regular lowering in the melting points of the periodides of each class, it being the highest in the hydriodides and the lowest in the hydrochlorides. It is a curious coincidence that the melting points of the analogous periodides of chlorocaffeine and bromocaffeine are so near alike, while the pure halogen caffeines themselves melt at 188° C. and 206° C., respectively. The perbromides do not show such a regular gradation. There is a difference in stability of the periodides of each class, corresponding to the lowering of the melting points, this being true of caffeine and bromocaffeine, where the periodide of the hydrobromide is less stable than the hydrochloride. There is a uniformity in composition between the periodides on one hand and the corresponding perbromides on the other, in each of the three bases. Thus, in caffeine it is always the tetrahalide compound that is more easily formed, and in chlorocaffeine and bromocaffeine it is the pentahalide. It will be noticed that all three hydrochlorides carry less iodine in the periodides than the salts of the other two halogen acids.

* * *

It is difficult to draw very general conclusions from the study of perhalides of only one base, but so far as they go, the results presented in the preceding pages justify in a certain degree the following conclusions:

(1) Organic bases are capable of forming periodides not only of their hydriodide salts, but also of the hydrobromides and of the hydrochlorides. The stability of the resulting periodide will be governed, all other conditions being equal, by the nature of the halogen through which the "periodine" is linked to the nitrogen, decreasing as the volatility of the halogen increases.

(2) When a base forms periodides, it is also capable of forming perbromides, which probably possess an analogous composition and constitution.

(3) If two nearly related compounds form under similar conditions periodides (or perbromides) of different degrees, then the periodide (or perbromide) containing the highest number of "perhalogen" atoms is not necessarily the more stable of the two. Compare, for instance, the tetraiodide and tetrabromide of caffeine with the pentiodide and pentabromide of bromocaffeine.

(4) The number of iodine atoms which a base takes up in the formation of a periodide is in no way an index of the basal power of the base. Caffeine, for instance, is a very weak base,[55] yet it forms higher periodides than the comparatively

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[55] This comparison, briefly made by Dr. Gomberg, may well be received with some attention to the definition of the terms "base", and "base-forming" element, in organic chemistry. Of course chemists restrict the term "base" to compounds of the nitrogen family of elements. The new iodoninum bases, on the hydroxylamine type, bring in an exception for iodine itself. On the contrary the alcohols, though capable of making both "neutral" and stable salts, with the acids, do not contain "base-forming" elements, as terms are used. As to caffeine, though it cannot make salts which are either "neutral" or stable, its molecule has four atoms of the "base-forming" element. A diureide, in fact a tetramide, it is not really an amine at all. With an acid-amide constitution, in its feeble union with an acid, its valence is seldom more than one, and it is not in evidence which one of its four nitrogen atoms, or whether or not more than one of them, be linked to the halogen atoms in perhalides. At any rate, these same base-forming elements, nitrogen especially, do have especial power to hold iodine in periodides. Certainly it is not mere positive polarity. If it were chlorine would be held by it with more strength than iodine is. It seems to enable iodine atoms to mass with each other in numbers greater than those in molecules of free iodine. Finally, when more than one halogen element is included in perhalide combination, the question of the halogen-holding power becomes quite a different question, one complicated with the well-known power of one halogen to unite with another, as in iodine trichloride, where no third element is concerned.

A. B. Prescott.

stronger bases of morphine, strychnine, atropine, etc. Again, chlorocaffeine and bromocaffeine, although far weaker than caffeine itself, forms higher periodides than the latter.

In conclusion, I wish to express my thanks to Mr. J. A. Keating and Mr. W. J. O'Brien, who have kindly helped me in this work.

* * *

It was the caffeine hydrogen pentiodide that was found by Dr. Gomberg to be formed promptly, and as the only periodide when caffeine is treated with the water solution of iodine in the presence of mineral acid. And this is the ground-work for the volumetric estimation of caffeine, in mineral acid solution, by titration with free iodine applied in aqueous potassium iodide solution, as next given by Dr. Gomberg. In use with the caffeine-bearing plant-products, this method is both exact and trustworthy, as experience for several months has convinced me. Its use in these plant-products, however, brings up the question of the theobromine reaction in this method. A few months ago, Mr. G. E. Shaw published an account of periodides of theobromine which he has obtained. Some attention has been given in this laboratory to the reaction of theobromine with Wagner's reagent, in presence of an acid, but we have not anything yet ready to report upon this subject.

ON THE ACTION OF WAGNER'S REAGENT UPON CAFFEINE AND A NEW METHOD FOR THE ESTIMATION OF CAFFEINE.[56]

The use of iodine in potassium iodide as a general qualitative reagent for alkaloids dates as far back as 1839.[57] It was, however, R. Wagner[58] who first employed it for the quantitative estimation of vegetable bases, and this solution has since been known as Wagner's reagent. He based his conclusion upon trials with solution of quinine and cinchonine, showing that under approximately similar conditions they always require the same amount of iodine for complete precipitation. Hence empirical factors could be established which would enable one to use a standard solution of iodine for the titration of all such alkaloids as form insoluble superiodides. The method, however, was not frequently employed, for the reason that there was no experimental proof as to the constancy of composition of the precipitates. Moreover, it was noticed that some of the precipitates give up a portion of their iodine to water, i. e., they are not completely insoluble. Hence concordant results could not be obtained. Later, Schweissinger[59] applied this method to the estimation of strychnine and brucine. His results have led him to the conclusion that while the method is very satisfactory for strychnine, it is far from being so for brucine. Recently Kippenberger,[60] in his research upon the isolation and separation of alkaloids for toxicological purposes, has reviewed the subject of the action of Wagner's reagent upon alkaloids, and gives considerable prominence to this as one of the best methods for the estimation of the vegetable bases. His method of procedure was practically the same as that first proposed by Wagner. The alkaloid is dissolved in acidulated water, and to the solution a tenth or twentieth normal solution of iodine in potassium iodide is gradually added until all the alkaloid is precipitated and the supernatant liquid shows a slight excess of iodine. Instead of filtering and washing the precipitate, as was done by Wagner and Schweissinger, Kippenberger allows the precipitate to settle, and either decants or filters off an aliquot portion of the mother-liquid for the estimation of iodine not taken up by the alkaloid. The estimation of iodine is always done by means of a standard solution of sodium thiosulphate.

It has been usually assumed, for reasons not entirely clear, that the composition of the precipitates is $Alk.HI.I_2$, i. e., diiodides of the hydriodides of the alkaloids are formed. Of the three atoms of iodine only two can be estimated directly by titration with sodium thiosulphate. The hydriodic acid is supposed to come from the potassium iodide, while the two "superiodine" atoms are furnished by the free iodine dissolved in the potassium iodide. The quantity of an alkaloid precipitated by a known volume of Wagner's reagent is calculated on this assumption, 2I: molecular weight of alkaloid :: amount of iodine taken up: x=amount of alkaloid. Schweissinger found that the method of calculation agrees entirely with the theoretical figures for strychnine. Kippenberger has called into question the correctness of this mode of calculation. He, too, assumes that the composition of the precipitates is to be represented by the formula $Alk.HI.I_2$, but he claims that all three atoms of iodine are supplied by the free iodine, and none by the potassium iodide. Therefore the calculation of the amount of alkaloid precipitated is to be done, according to Kippenberger, by the use of the proportion, 3I: moleular weight of alkaloid :: amount of iodine taken up: x= amount of alkaloid.

The hydriodic acid, it is supposed by Kippenberger, results from the interaction of iodine and water,

$$2I+2H_2O=2HI+H_2O_2,$$

a reaction which is facilitated or induced by the avidity of the alkaloids to form insoluble periodides of the hydriodides. His reasons for assuming that such a peculiar reaction takes place under the simple conditions of precipitation, are too lengthy to be given here. All his arguments rest upon the assumption that all alkaloids form periodides of uniform composition, $Alk.HI.I_2$, and that the same alkaloid gives always the same periodide. Now, there is no reason, *a priori*, why this should be the case. Jörgenson's[61] extended researches show that different alkaloids, when treated under apparently the same conditions, give periodides of entirely different compositions. Thus, morphine gives with Wagner's reagent $Alk.HI.I_3$;[62] codeine furnishes with excess of Wagner's reagent $Alk.HI.I_4$; and caffeine, as will be shown, gives $Alk.HI.I_4$, etc. It is safe to say that not until we ascertain exactly the composition of the different periodides as produced under the conditions of titrations, will the use of Wagner's reagent for quantitative purposes be placed upon a sound basis.

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[56] A paper by M. Gomberg, Instructor in Organic Chemistry, in the University of Michigan, from J. Am. Chem., April, 1896, Vol. 18, p. 331.

[57] Bouchardat: Compt. Rend., 9, p. 475.

[58] Dingl. poly. J., 161, p. 40; Ztschr. anal. Chem., 1, p. 102.

[59] Arch. d. Pharm., 64, p. 615.

[60] Ztschr. anal. Chem., 34, p. 317; 35, p. 10.—Nearly in full in Analyst, 20, p. 201.

[61] J. prakt. Chem., 1870, [2], 2, p. 433, etc.

[62] Jörgenson, 1870: J. prakt. Chem., [2], 2, p. 438.

I have dwelt at such length upon this subject, because the method for the estimation of caffeine presently to be described, is based upon experimental evidence which is entirely contradictory to Kippenberger's conclusions. Whatever the cause may be with other alkaloids, his theory as to the production of hydriodic acid from iodine and water, does not hold good in the case of caffeine.

Wagner, in describing his method, gives a list of alkaloids which are completely precipitated by iodine solution, and also mentions that "caffeine, theobromine, piperine and urea are not precipitated at all."[63] His statement, so far at least as caffeine is concerned, has stood since then uncontradicted. It has found its way not only into standard treatises and text-books,[64] but even into periodical literature of recent date. As late as 1894, Kunze,[65] in reviewing the chemistry of caffeine and theobromine, calls attention to this peculiarity of the two alkaloids. The non-precipitation of caffeine by Wagner's reagent has come to be recognized as a distinguishing feature of this alkaloid from almost all other vegetable bases.

And yet this is entirely contrary to actual facts. Instead of forming an exception, caffeine conforms to all the requirements necessary in the application of this test.[66] It is well known that most of the alkaloids as such are insoluble or only very slightly soluble in water; they require the presence of some acid for their complete solution. In other words, alkaloids in the form of their salts, are soluble in water. Whenever Wagner's reagent is applied for the precipitation of an alkaloid, it is always applied to a solution of some salt of it, preferably acidulated with sulphuric or hydrochloric acid. Therefore, even when strictly neutral salts of alkaloids are employed, there is still the possibility of the formation of hydriodic acid, or rather of the hydriodides of the alkaloid, as for instance, Alk.HCl+KI=Alk.HI+KCl. The hydriodide thus produced is at once precipitated as a periodide. Now, it so happens that caffeine is tolerably soluble in water, and it has become customary to work with solutions of caffeine as a free alkaloid, and not in the form of its salts. The question as to whether solutions of free alkaloids are precipitated with Wagner's reagent has not, to my knowledge, been studied. My preliminary experiments in that direction show that at least some alkaloids (morphine, atropine, strychnine, etc.) are precipitated. I have not examined yet whether these periodides are identical in composition with those produced from the salts of the alkaloids. But so far as caffeine is concerned, it is true that a neutral solution of it gives no precipitate when treated with a solution of iodine in potassium iodide. When, however, the addition of Wagner's reagent is either followed or preceded by the addition of some dilute acid, there is at once thrown down a dark-reddish precipitate, remaining amorphous even on long standing.[67] The composition of this periodide is, as will be shown, $C_8H_{10}N_2O_4HI.I_4$. It was obtained for analysis in many different ways—by using either caffeine or iodine in excess, and by employing different acids. The periodide produced is, however, always of the same composition. The precipitates were allowed to settle, filtered by means of a pump, washed with water to remove the excess of potassium iodide, dried on porous plates, and finally in a vacuum over sulphuric acid.

I. This sample was obtained by slowly adding a solution of iodine in potassium iodide to a solution of caffeine acidulated with sulphuric acid. The iodine was added until the supernatant liquid was decidedly red. The whole was allowed to stand three hours, filtered, washed and dried as described above. The total iodine was estimated in the usual way, *i. e.*, by suspending a weighed sample in water, adding sulphurous acid solution, then silver nitrate and nitric acid; filtered, washed and dried. The "exterior" iodine, *i. e.*, the iodine not as hydriodic acid, was estimated by direct titration with standard sodium thiosulphate.

0.2002 gr. gave for total iodine 0.2785 gr. AgI.
0.2358 " " " exterior " 0.1433 gr. I.

II. This sample was obtained by adding to an acidulated solution of caffeine enough iodine to precipitate about one-half of the caffeine present.

0.2563 gr. gave for total iodine 0.3591 gr. AgI.
0.1659 " " " exterior " 0.0997 gr. I.

III. A neutral solution of caffeine was mixed with an excess of Wagner's reagent, and to the mixture dilute sulphuric acid was gradually added so long as a precipitate was produced.

0.4039 gr. gave for total iodine 0.5668 gr. AgI.
0.1424 " " " exterior " 0.0866 gr. I.

IV. Filtrates from I. and III., on long standing, gave a deposit of dark-blue needle-like crystals, which were collected, washed and dried as before.

0.7884 gr. gave for total iodine 1.1064 gr. AgI.
0.4450 " " " exterior " 0.2685 gr. I.

V. This was obtained by recrystallizing the amorphous precipitate from methyl alcohol.

0.2890 gr. gave for exterior iodine 0.1756 gr. I.

VI. Obtained by recrystallizing the amorphous periodide from hot ethyl acetate.

0.4807 gr. gave for total iodine 0.6709 gr. AgI.
0.2777 " " " exterior " 0.1625 gr. I.

Calculated for $C_8H_{10}N_4O_2.HI.I_4$.	Per cent.
Total iodine	76.44
Exterior iodine	61.15

Found.

I.	II.	III.	IV.	V.	VI.
75.12	75.66	75.84	75.83	......	75.40
60.79	60.11	60.81	60.34	60.76	60.22

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[63] Loc. cit. 41.

[64] Prescott, Organic Analysis, p. 80; Allen, Comm. Organic Analysis, Vol. 3, (2), p. 481; Flückiger, Reactions (Nagelvoort's Translation), p. 26; not affected by Wagner's reagent in either neutral or acid solutions; Dragendorff, 1888, Ermittelung von Giften, says that caffeine gives a dirty brown precipitate. From the text it is not improbable he used iodine in hydriodic acid.

[65] Ztschr. anal. Chem., 33, p. 23.

[66] I do not well understand this statement as to "all the requirements necessary" in the test with Wagner's reagent. The paper was published by Dr. Gomberg before he left for Europe a month ago. To be sure it is a possible requirement that could have been made at any time for the test, that the solution must always be made acidulous with mineral acid before adding Wagner's reagent, for the presence of alkaloids. I find I have myself advised such acidulation, without intimation that it was necessary. When no stipulation for acidity of the solution is made, the operator usually takes the neutral aqueous solution. In this solution, as is clear from Gomberg's statements in the paragraph above, as well as from his assay-method at the close of his paper, the test distinguishes caffeine from the pyridine derived alkaloids.

[67] Almost the same can be said of theobromine, making allowance for the difference of solubility of the alkaloid in water. A saturated solution of it (containing one part of theobromine to 1600 of water) gives no precipitate with Wagner's reagent, but on the addition of a drop of acid there separates in a short time a crystalline periodide. Contrary to usual statements, I find that theobromine in acid solutions gives a heavy precipitate with Wagner's reagent, of a peculiar dirty-blue color.

When some of the periodide is treated with a solution of sulphur dioxide, and then extracted with chloroform, it furnishes unchanged caffeine.

The composition of this periodide of caffeine appears to be different from that described by Tilden,[68] which he obtained by exposing to sunlight an alcoholic solution of caffeine containing some hydriodic acid. The slow oxidation of the hydriodic acid furnished the iodine, and the compound thus obtained has the composition, according to Tilden, $2(C_8H_{10}N_4O_2HI.I_2).3H_2O$. It is a lower periodide than the one which is obtained when iodine dissolved in potassium iodide is directly added to caffeine, as the latter has the composition $C_8H_{10}N_4O_2.HI.I_4$. Tilden also mentions that by the addition of alcoholic iodine to a solution of caffeine in weak sulphuric or hydriodic acid, he obtained a deposition of black granules, which upon analysis furnished about seventy-five percent of total iodine. He says that it probably consists of a compound containing nine atoms of iodine. But there is hardly any doubt that he had the tetraiodide of caffeine hydriodide.

Properties.—When dry the periodide is a violet-blue amorphous powder melting at 213°. When moist it rapidly loses iodine on exposure to air. It is permanent when dry and suffers but slight loss when heated to 100° C. Two grams when heated for four hours at that temperature lost only 0.027 gram = 1.33 percent. It loses but very little of its iodine when suspended in water, giving off enough iodine to saturate the liquid. The presence of potassium iodide in the water favors the liberation of iodine, but even then it is but slight. The periodide dissolves readily in alcohol, especially when heated, with considerable decomposition into the free base and iodine. It is more soluble in methyl alcohol and suffers less decomposition in that solvent. It can be obtained from methyl alcohol, on spontaneous evaporation of the solvent, in the form of beautiful crystals, with a metallic dark-bluish lustre. When examined under the microscope the crystals appear to consist of six-sided prisms. Ether, whether cold or warm, decomposes it but slightly. The periodide is insoluble in chloroform, carbon disulphide and benzene. It is soluble without decomposition in hot ethyl acetate, from which it separates on cooling as a dark granular crystalline deposit, which melts at 215° C.

Limits of Precipitation.—Like most alkaloids, caffeine is precipitated by Wagner's reagent even from very dilute solutions of the base. Although not characteristic, it is yet as delicate a test for caffeine as we have. The limits of precipitation, under the influence of different acids, will appear from the following table. The tests apply to one cc. of the solution mentioned, acidulated with two or three drops of the acid, and to this two drops of Wagner's reagent (twentieth normal) was added.

Dilution.	Sulphuric acid. Five percent.	Hydrochloric acid. Five percent.	Nitric acid. Five percent.	Acetic acid. Five and fifty percent.	Oxalic acid. Five percent.	Tartaric acid. Ten percent.	Citric acid. Ten percent.
1 : 250	v. heavy.	v. heavy.	v. heavy.	none.	heavy.	slight.	faint.
1 : 1000	v. heavy.	v. heavy.	v. heavy.	....	heavy.	v. sl.	none.
1 : 1500	heavy.	heavy.	heavy.	....	sl.	none.	....
1 : 3000	fair.	fair.	fair.	....	faint.	....	....
1 : 5000	v. sl.	sl.	sl.	....	....	....	....
1 : 8000	v. sl.	sl.	sl.	....	....	....	....
1 : 10000	none.	v. sl.	v. sl.	....	....	....	....

Estimation of Caffeine.

All the methods for the estimation of caffeine depend upon the extraction of the alkaloid by an immiscible solvent from either a dry residue, or from its solution in water. But Spencer[69] has recently shown how difficult it is to remove the alkaloid from its solution in water. According to him, it is necessary to shake out the liquid at least seven times with chloroform, in order to remove caffeine quantitatively. It is usually stated that caffeine does not form any stable salts in a watery solution, and consequently it can be shaken out with immiscible solvents from either alkaline or acid solutions. But this is only relatively true, as will appear from the following illustrations. 1.0085 grams of caffeine were dissolved in sixty cc. of sulphuric acid (1 : 10), and this solution was repeatedly shaken out with chloroform, twenty-five cc. at a time.

10 consecutive portions of chloroform gave a total of 0.4514 gram caffeine.
3 additional portions of chloroform made a total of 0.4859 gram caffeine.
3 more additional portions of chloroform made a total of 0.5034 gram caffeine.

The extreme delicacy of the test for caffeine by means of Wagner's reagent, has suggested the possibility of applying this reagent for the quantitative estimation of the alkaloid. Its successful application necessitates, of course, a solution of the alkaloid free from other substances that are precipitated by, or absorb iodine, — a condition requisite in the estimation of any base by means of Wagner's reagent. This method gives very satisfactory results, as nearly theoretical as could be expected. I am indebted for the analytical data of the subjoined table to Mr. James W. Knox, holder of the Stearns' Fellowship in the School of Pharmacy. The method of procedure employed by us was practically the same as that used by Kippenberger. Definite volumes of acidulated solutions of caffeine were precipitated with a known volume of iodine in potassium iodide. After complete precipitation an aliquot portion of the supernatant liquid was obtained, either by decantation or filtration, and the excess of iodine was estimated by titrating against a tenth normal solution of sodium thiosulphate. The precipitation is best performed in a tall test-tube on foot, and the solution for titration is removed directly by immersing the end of the burette into the liquid and applying suction at the upper end. When it is desirable to filter off an aliquot portion, a filter of glass-wool and asbestos gives very satisfactory results.

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[68] J. Chem. Soc., 18, 99.

[69] J. anal. Chem., 4, p. 390.

We have tested the method on solutions of caffeine acidulated with sulphuric acid, the solutions being of different strengths, namely: containing 0.25 percent of caffeine, 0.50 percent, 0.75 percent, and 1.00 percent, respectively. We have varied in different series of experiments the amounts of Wagner's reagent, employing just the theoretical quantities, a small and large excess above that, as well as quantities below those required by the theory. Columns I, II, III, and IV give the results obtained by allowing the solutions to stand for an hour before decanting an aliquot portion for titration: column V shows the results obtained when the liquid for titration was filtered off within five minutes after the addition of Wagner's reagent. The results are calculated on the basis that the periodide has the composition $C_8H_{10}N_4O_2.HI.I_4$. The amount of alkaloid is calculated from the amount of iodine used up, by the formula,

$$4I : C_8H_{10}N_4O_2 : : 506 : 194;$$

i. e., one part of iodine represents 0.3834 parts of caffeine. Or, one cc. tenth normal iodine = 0.00485 grams caffeine.

The results presented below show that the estimation of caffeine by this method is very exact. The best results are obtained when iodine is in considerable excess, as is evident from the figures where one and one-third and twice the theoretical quantities of Wagner's reagent were used. All the results in the table were obtained on solutions of caffeine acidulated with sulphuric acid, the acidulation being tolerably strong, about one cc. of the concentrated acid to fifty cc. of the liquid. Experiments upon the influence of the acid indicate that a large excess of sulphuric acid interferes to some extent with the reaction. The amount of recovered caffeine falls as low as ninety-five percent of the quantity taken, when four cc. of the concentrated acid to fifty cc. of the liquid are used. The results are also not very uniform and concordant. The fact that the precipitation of caffeine by Wagner's reagent is more delicate in presence of hydrochloric acid than any other acid would make it advisable to employ that acid in quantitative estimation of the base by iodine.

	I.			II.			III.			IV.			V.		
	Solution containing 0.25 percent of caffeine.			Solution containing 0.50 percent of caffeine.			Solution containing 0.75 percent of caffeine.			Solution containing 1.00 percent of caffeine.			Solution containing 0.50 percent of caffeine.		
Wagner's reagent employed.	Taken.	Found.	Percent recovered.	Taken.	Found.	Percent recovered.	Taken.	Found.	Percent recovered.	Taken.	Found.	Percent recovered.	Taken.	Found.	Percent recovered.
Theoretical quantity + 2 cc.	0.0600	0.0591 0.0589	98.33	0.1200	0.1175 0.1175	97.82	0.1500	0.1481 0.1471	98.40	0.1200	0.1182 0.1179	98.38	0.1200	0.1154 0.1165	96.78
1⅓ theoretical quantity.	0.0750	0.0749 0.0749	99.88	0.1200	0.1191 0.1189	99.17	0.1500	0.1489 0.1485	99.13	0.1200	0.1191 0.1187	99.12	0.1200	0.1196 0.1197	99.75
Twice the theoretical quantity	0.0500	0.0502 0.0506	100.80	0.0800	0.0805 0.0789	99.63	0.1200	0.1184	98.67	0.1100	0.1091 0.1091	99.18	0.0800	0.0802 0.0791	99.63
One-half of the theoretical quantity.	0.0750	0.0363 0.0363	48.40	0.1600	0.0794 0.0794	49.62	0.2250	0.1107	49.20	0.2000	0.1067 0.1067	53.35	0.1600	0.0791 0.0791	49.44

This method could easily be employed for the estimation of the alkaloid in caffeine-bearing drugs. Of course, it is necessary to have the final solution of the alkaloid in water as free as possible from other substances that may be precipitated by Wagner's reagent. The estimation of caffeine by this method is likely to give higher results than have hitherto been obtained. The following procedure is recommended.[70] The drug is thoroughly digested with water for some time, by the aid of heat, cooled, and made up to a definite volume, and filtered. An aliquot portion of the filtrate is treated with lead acetate, the precipitate allowed to settle, and filtered. The whole of the filtrate, or a given portion of it, is treated with hydrogen sulphide to remove the lead, and filtered. This filtrate, after boiling off the hydrogen sulphide, is divided into two equal portions, and each treated with a definite volume of the standard iodine solution, — the first portion without the addition of any mineral acid, the second with the addition of hydrochloric or sulphuric acid. After five to ten minutes standing the excess of iodine is estimated in each of the two solutions, as described above. The first portion, containing no other but some acetic acid, serves to indicate whether the filtrate from the lead sulphide contains any other materials besides caffeine that are likely to be precipitated by Wagner's reagent, — for caffeine itself is not precipitated by it even in presence of tolerably strong acetic acid. If any absorption of iodine be found in the first portion, then that quantity is to be subtracted from the amount of iodine taken up by the second portion; the difference represents the iodine used up in the formation of the periodide of caffeine. The amount thus used up, multiplied by 0.3834, gives the amount of caffeine in that particular portion of the liquid.

Betel Chewing.*

By Dr. *Rodney H. True.*

To all who take pleasure in a wonderful symmetry and perfection of form, the palm furnishing the betel nut is said to offer great delight. A straight, smooth, slender shaft of a dark green or grayish-green color, it stands, supporting at its summit six or eight long, shining, feathery leaves.

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[70] These directions are in part those given by Spencer, 1890: J. anal. Chem., 4, p. 390.

* Continued from p. 133.

Although attaining a height of from fifty to a hundred feet, its trunk is a column having a diameter of less than a foot even at its base. So graceful is its entire aspect that the Indian poets say it is an arrow shot down upon the earth from heaven. Others compare it to the form of a beautiful woman and praise it as being not merely the most beautiful of trees but also as the benefactor of him who cultivates it.

Seen either as a single object of rare grace of outline (Fig. 1, p. 130) or in groves fringing some oriental jungle (Fig. 6), this palm seems to justify the claim made for it by its poet friends.

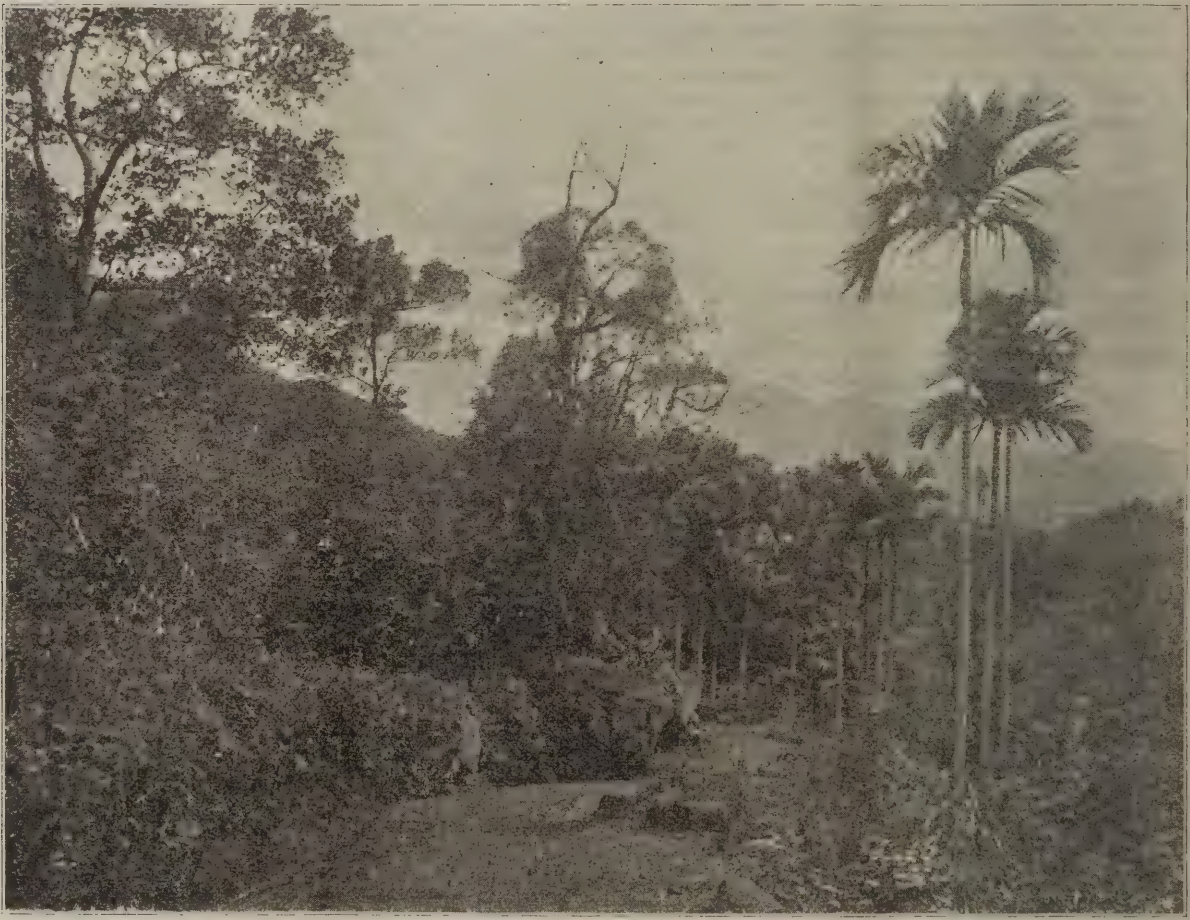

Fig. 6. **Jungle in Java with Areca palms.***

Where its first home was, is difficult to determine, since it has for untold centuries been cultivated in so many parts of the tropical world. It is still found growing wild in the Philippine Islands. and is probably to be regarded as a native of tropical Asia, India or eastward, or of some of the adjacent islands. It now has practically the same geographical distribution as the betel chewing habit.

Although it thrives in ordinary soils, the culture of the betel palm necessitates a long period of patient work before results begin to appear. The seeds first ripened are chosen for planting. After the winter solstice, they are removed from the trees, thrown into heaps and kept in houses for several days prior to being planted. The soil chosen for the seed bed must be well dug over to a depth of from one to two feet; the rich surface soil is removed and manure or other fertilizers are spread over the surface. The nuts are laid close together upon this layer, with the so-called "eyes" turned upward and are then covered with the rich soil before removed. Buried thus beneath an inch or so of earth, the seeds are watered daily for three months. At the end of this time, the seedlings reach a height of three or four inches and must be transplanted into a bed prepared in the manner just described. Here at a distance of about a foot and a half from each other, they grow for about three years, receiving water every day during that time. The young palms are next transplanted to larger quarters in carefully prepared soil at a distance of about twenty-five feet from each other. Among them are planted musa, cocoa and orange trees and perhaps around all a thick hedge of *Euphorbium* or *Jatropha Curcas*. One more transplanting after another three years brings the trees finally into their permanent quarters where with frequent digging over and fertilizing of the soil and monthly irrigation, they come to bearing at an age of from six to ten years. From twenty-five to thirty years is the usual time during which the areca palm is expected to continue fruitful.

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* Figs. 1 and 2 from photographs exhibited at the World's Fair from Java, now in the Pharmacognostical Collection of the University of Wisconsin.

The leaves are about fifteen feet long with opposite pinnæ. Some are slightly ascending forming the feathery crown, others of somewhat different form are somewhat inclined to be pendant. Each of the narrowly-lanceolate, pointed pinnæ is about a yard long. The sheathing base of the leaf is broad and during the rainy season protects the inflorescence which develops in the axis of the leaf. The areca leaves fall during our winter months. So important to the natives is this tree that the Malays in places date the beginning of the new year from the time of the fall of the betel palm leaves.

The areca palm blooms throughout the entire year and may have at the same time flowers and fruit in various stages of growth. The flower clusters develop in the axils of the leaves, coming, however, to the blooming stage only after the fall of the leaves. Thus the flowers and fruits come to be situated on the stem a little below the leafy crown. The somewhat broom-shaped flower clusters, enclosed in the smooth, oval-lanceolate spathe, consist of unisexual flowers, the male being more numerous and situated along the distal parts of the axis, the fewer female flowers toward their bases. The flowers themselves are inconspicuous in appearance. At the time of flowering, a pleasant fragrance emanates from the pistillate flowers.

The time necessary to bring the fruit to maturity is about six months, but after three months of growth the young nuts are sometimes used. The fruits develop inside of the spathe until finally the pressure generated splits it and the clusters of egg-sized nuts are to be seen in the shade of the thick leaves hanging from a thick axis. The mature nuts are surrounded by a fibrous, husk-like covering which has a thickness of about one-fourth of an inch. The nuts themselves on being freed from the coverings are of various shapes and sizes according to the variety. In general, they preserve the egg-like form of the whole fruit. The outer surface of the free nut is marked more or less distinctly with a mesh-like pattern. The attachment of the seed is at its broad end. The average weight of a betel nut is from five to seven grams; its specific gravity about 1.25.

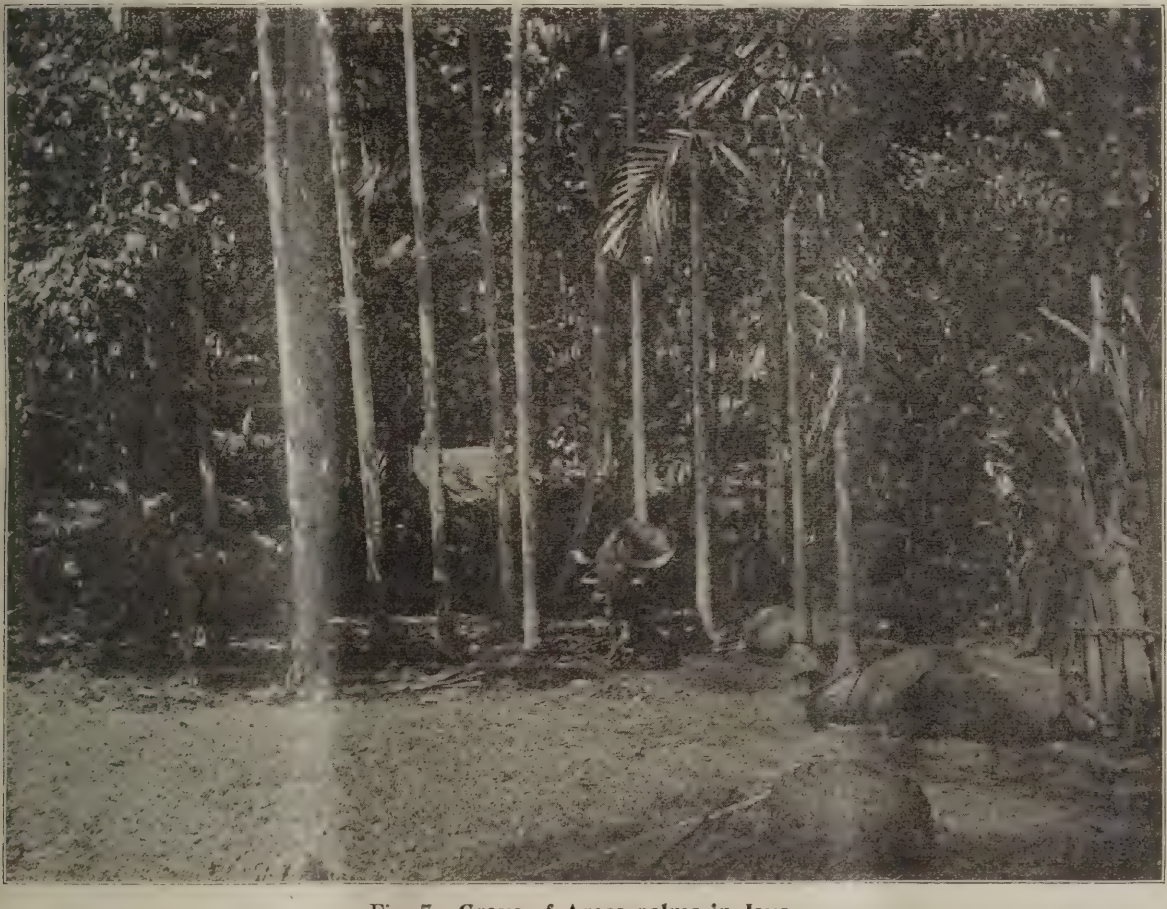

Fig. 7. **Grove of Areca palms in Java.**

When seen in section, the nut is made up of two sharply contrasting tissues, the white, horny albumen and reddish streaks which wind in an irregular manner from the circumference nearly or quite to the center. These reddish lines mark the infoldings of the seed coverings. The albumen is composed of sclerenchyma cells with strongly marked pits; the reddish lines of smaller, thin-walled parenchyma cells filled with a reddish-brown substance.

The nuts when ripe do not fall from the trees, but are picked by a particular class of people who make this their business and hire out to the raisers during the harvest seasons. The fruitfulness of this palm is shown by the fact that an average tree in India yields six hundred nuts, as many as a thousand being sometimes taken from a tree.

Lewin, on whose authority a great part of that here given rests, found as a result of his chemical investigations of the areca nut a snow-white, crystalline fat present in an amount varying from fourteen to eighteen percent. When fresh, this fat is tasteless with a light, pleasant odor reminding one of cacao. It was found to consist mainly of lauric, myristic and palmitic acids. The most active principle present appears to be the alkaloid arecoline. In doses of from ten to twenty milligrams, it proved fatal to cats. It slows the heart's action and affects respiration. In fatal doses, respiration ceases before the heart's action is stopped. Poisoning with arecoline is accompanied by a strong contraction of the pupil. Arecaine and its isomer arecaidine, choline and guvacine, all of them bases, have also been isolated from the areca nut.

Fig. 8.

Betel pepper vine festooning a small tree — India.*

Although cultivated widely and over the general area characterized by the betel habit, still within this area a considerable commerce in betel nuts exists. The chief points of export are Ceylon, the Straits Settlements and Sumatra. The chief importing countries are India, despite the enormous home production, and China.

The leaf of the betel pepper, *Piper betle* L., is a necessary constituent of the betel roll. This plant, as its name indicates, is a near relative of a number of well known things — the pepper, the cubeb and the kava-kava, now attracting some attention in medicine — are all members of this genus and, in their habits and appearance, more or less closely resemble it.

The betel pepper is a perennial, creeping vine which by means of long tendril-like structures fastens itself upon whatever support it chances to find. The flowers are diœcious, the stamens and pistils being found in separate flowers. The root is much branched; the stem, round and woody, of about the size of a person's finger, is smooth, much branched and of a jointed structure. At the nodes many small, clinging roots are given off which serve to fasten the vine to its support. The internodes are from three to five inches long. The broadly heart-shaped or sometimes more nearly rounded leaves have entire margins and are more or less acuminately pointed. They are mostly membranaceous, rarely somewhat leathery, smooth on both sides, marked by translucent, punctate dots. The upper surface is shining, the lower pale-green. In size the leaves are from three to seven inches long and from two to four wide. The flowers, as is usual in this family, are in catkin-like aggregations.

The plant lives from twenty to thirty years but gives the best product during the first six or seven years. It prefers a moist, rich, clay soil in shady places.

The betel pepper, like the betel palm, has been under cultivation for unknown centuries and the accounts given five hundred years ago concerning the methods, show that time has brought about no essential change. Division of labor in East India has resulted in a class of people whose exclusive occupation is the cultivation of the betel pepper, and still another class fulfils the function of middleman by getting the crops marketed.

Growing the betel vine demands the greatest care and industry and many risks have to be run since the plants are liable to injury from many causes. Beside guarding from insect pests, too much exposure to the sun and injury from strong winds threaten the crop. If, however, the work is rewarded by a good crop of leaves, the profits are great.

In Mysore in July and August, ditches half a yard wide, of like depth and about forty feet long are dug at a distance of about five feet from each other. The land between the ditches is made into beds in which are planted at first quickly growing plants to serve later as supports for the betel vines. Every second day the bed is sprinkled and the ditches filled. After four months, the cuttings of the pepper are set in the beds in two rows. These cuttings are about two feet long and stand from three to five feet apart in the row. The garden is then surrounded by a hedge of *Euphorbium Tirucalli.* The trenches must be kept filled and the beds frequently watered. After about three months the pepper vine begins to cling to its supports when the weeds are cleaned out and the soil about the plant manured. This careful attention is finally rewarded after nearly two years with leaves fit for use.

The leaves for market are picked by hand from the branches which hang free from the support, those from parts attached to the tree or pole on which the vine climbs being regarded as unfit for use. The largest as well as the smallest leaves are discarded. Since the leaves decrease in size after the plant reaches a certain age, those from old plants are undesirable. The leaves are best when used fresh and an acceptable method of preservation for more than a few days does not seem to be in use.

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* From Tschirch's Indische Heil- und Nutzpflanzen — with permission of author and publisher.

Lewin, Eijkmann and others who have studied the betel leaf from the chemical standpoint, found as constituents a small quantity of a volatile oil, a resin-like body and traces of an alkaloid. The volatile oil has a light-brown color, an agreeable tea-like odor and contains, according to Power's Catalogue, betle-phenol, or para-eugenol and cadinene. According to Schmidt, this oil is located in the mesophyll cells of the leaf in close connection with the chlorophyll, and not, as would be expected, in the glands of the leaf.

The physiological action of the betel leaf is not very pronounced. When fresh, the leaves have a very strong, peculiarly aromatic odor, those growing exposed to the sunlight being sharper in taste than those grown in the shade. No plain symptoms follow the use of the leaves and Lewin regards it as doubtful whether more than the taste imparted to the betel roll is contributed by this constituent. Experiments on animals with powdered leaves gave negative results. The oil, however, showed itself more active. It has an anæsthetic action locally like that seen in its congener, the kava-kava plant. In subcutaneous injections, it acts as a narcotic preceded by a stage of over-excitation.

Schimmel & Co. report it as useful therapeutically in the treatment of inflammation of the mucous membranes of the larynx and the throat.

The third usual constituent of the betel roll is lime. This is of organic origin, corals and the shells of large sea mollusks being burnt and powdered.

The part played by the lime in betel chewing is an important one. In answer to the question, why it is essential, Lewin states it as probable that the lime releases the alkaloids present in combination with tannin and other substances and enables them to produce their characteristic results. He also regards the presence of lime as necessary to the formation of the fragrant volatile principle in the betel nut which gives to the breath of the betel chewer its pleasant scent. The part played by the betel leaf beyond the slight anæsthetic action on the tongue and mouth and the aromatic qualities of the oil seems to be unimportant.

TRANSLATIONS.

Reagents and Reactions known by the Names of their Authors.*

Based on the original collection by *A. Schneider*, revised and enlarged by Dr. *Julius Altschul.*

Eleven years ago *A. Schneider* published in the Pharmaceutische Centralhalle a collection of reagents and reactions known by the names of their authors. This compilation was printed in No. 35 of the year 1885 after it had been published in somewhat abbreviated form in the Pharmaceutischer Kalender for 1885, which appeared in 1884. This first attempt at an alphabetical compilation of reagents and reactions commonly and only semi-occasionally known by the names of their authors met an undeniable demand. The number of such reactions and corresponding reagents, especially for qualitative tests, is constantly growing. In the study of chemical literature the reader frequently loses the significance of a reference to such reagents or reactions because he is not familiar with the name of the author, which stands for the chemical synonym, or cannot readily find the necessary literary reference. The following list is to assist the reader in such emergencies. That the original list filled a gap in chemical literature was clearly demonstrated by the fact that the edition of that number of the Centralhalle, although larger than usual, was rapidly sold, and also by the numerous reprints. The original list also led to the preparation of new lists, of which might be mentioned the collection of *Julien Delaite*, Luettich, 1892; that of *Alberto Janssen*, Florenz, 1894; of Dr. *C. Duennenberger*, Zuerich, 1894; and of *Schneller*, Eichstaett, 1894.

In none of these collections is any reference made to the original list of Schneider. From a note in *Krauch's* Prüfung der chemischen Reagentien, III. Auflage, p. 394, in which the work of Dr. Duennenberger and of *Ferdinand Jean* et *G. Mercier*, Repertoire des réactifs spéciaux, généralement désignée sous leurs noms d'auteurs, Paris, 1896, is mentioned without a reference to the collection of Schneider, it seems apparent that the original has been forgotten. The Pharmaceutische Centralhalle has therefore seen fit to publish a revised list based on the original one of 1885, in which the more recent literature is duly considered. The growth of this literature is readily indicated by the fact that the list published in 1885 contained about 200 articles (Dr. Duennenberger's list contains 350), whereas the present list contains over 600 articles and cross references. The author does not even now claim completeness for his list, but hopes that in its new form it may prove a serviceable adjunct both in study and laboratory practice.

As far as the selection of material is concerned stress has been laid principally on qualitative reactions. Quantitative tests have been added only in so far as they serve also for qualitative determination. Most of the items belong to the technical, pharmaceutical and physiological branches of chemistry. Of bacteriological reagents only a few of the most important were added.

The author has taken special pains to call attention, by means of cross references, to relations existing between different reactions, and particularly to the numerous modifications of some of the more important reactions. An index is added to facilitate the use of the collection.

Adamkiewicz' reaction for albumen. The acetic acid solution of albumenous substances is colored violet upon the addition of concentrated sulphuric acid, and possesses a greenish fluorescence. The same reaction results if the albumen is treated with a mixture of 1 vol. of concentrated sulphuric acid and 2 vol. of glacial acetic acid. The reaction is facilitated by the application of heat, also, according to *Wurster*, by the addition of a few grains of sodium chloride.

Agostini's reaction for glycose. If to 5 drops of the urine to be examined 5 drops of ½ p. c. gold chloride solution and 3 drops of 20 p. c. potassa solution are added, and the mixture is gently heated the presence of sugar in the urine will be indicated by the formation of a red color.

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* Translated for the Review from the original in Nos. 28 and 29 of the Pharmaceutische Centralhalle, 1896.

Allen's reaction for vegetable fats. Equal volumes of fat and nitric acid, sp. gr. 1.4, are shaken for ½ minute and then set aside for 15 minutes. The presence of vegetable fats (cottonseed oil) is indicated by the formation of a coffee-brown color.

Allen's reaction for phenol. With hydrochloric and nitric acids phenol produces a carmine-red color.

Almén's reagent for blood. A liquid containing blood, when well shaken with a mixture of equal parts of guaiac tincture and turpentine oil, becomes blue owing to the precipitation of guaiac resin. The color is permanent to heat. See also *Weber* and *Schoenbein.*

Almén's tannin solution serves as a precipitant for albumen. It consists of a solution of 4 grams tannin, 8 ccm. of 25 p. c. acetic acid and 190 ccm. of 40 to 50 p. c. alcohol. It also precipitates nucleoalbumin.

Almén's reagent for glucose is prepared by digesting 2 grams of basic carbonate of bismuth with 100 ccm. potassa solution, sp. gr. 1.33, and 4 g. Rochelle salt. Upon cooling the clear solution is decanted from the precipitate. 1 ccm. of the reagent is boiled for several minutes with 10 ccm. of urine. If glucose is present a yellowish-brown precipitate results, which becomes darker and finally black.

This reagent is also known as the *Boettger-Almén* reagent. Compare also *Nylander's* solution.

Anderson's reaction for distinguishing between chinoline- and pyridine salts. The chloroplatinates of the latter, when boiled with water, are converted into insoluble double salts with the elimination of hydrogen chloride, whereas the former remain in solution.

Arata's test for artificial dyestuffs in wine depends upon the observation that these dyestuffs are abstracted from the wine by means of wool. The fibre is then subjected to special reactions.

Arndt's determination of sugar by means of the ferment saccharometer. See *Einhorn.*

Arnold's reactions for alkaloids.

I. Some alkaloids when heated on the water-bath with syrupy phosphoric acid, obtained by dissolving metaphosphoric acid or phosphoric acid anhydride in officinal phosphoric acid (Ph. G. III), produce characteristic color reactions: aconitine—violet; nicotine—yellow; coniine—green.

II. Triturated with conc. sulphuric acid, many of the alkaloids yield characteristic color reactions upon the addition of conc. 30 to 40 p. c. alcoholic (in some instances aqueous) potassa solution.

III. *Arnold-Vitali's* reaction. A small quantity of alkaloid is triturated with conc. sulphuric acid and a grain of sodium nitrite is added; then as in II. strong potassa solution. A number of alkaloids produce characteristic color reactions. Thus e. g. atropine and homatropine produce with sulphuric acid and sodium nitrate an orange-yellow color which upon the addition of the potassa becomes reddish-violet and fades to rose-red.

Arnold's reaction for narceine. Upon heating a substance containing narceine with conc. sulphuric acid and a trace of phenol a reddish color is produced.

Axenfeld's reagent for albumen is a 0.1 p. c. solution of chloride of gold. The solution to be tested is acidulated with formic acid and heated with a drop of the reagent. If albumen is present the solution becomes purplish, upon the addition of more gold chloride, blue. The latter color reaction is also produced by glucose, starch, tyrosine, lencine, etc., but the purplish color is characteristic for albumen.

Aymonier's reaction for α-naphthol. The 15 p. c. alcoholic solution of α-naphthol is colored violet upon the addition of cane sugar and mixing with 2 vol. sulphuric acid. Upon the addition of one drop of a mixture of 1 p. potassium bichromate, 10 p. water and 1 p. conc. nitric acid the same α-naphthol solution yields a black precipitate. β-naphthol does not produce either of these reactions.

Bach's reagent for hydrogen peroxide, consists of the following solutions:

a) 0.03 potassium bichromate and 5 drops of aniline in 1 liter of water;

b) 5 p. c. oxalic acid solution.

5 ccm. of the solution to be tested, when shaken with 5 ccm. of solution a) and 1 drop of solution b), yields a violet-red coloration when hydrogen peroxide is present.

Barbot's reagent for fatty oils is fuming nitric acid. Wheh mixed with this reagent different oils show different behavior with regard to coloration and solidification. Olive oil, for example, yields a white (not red or brown) mixture which solidifies after 1 to 2 hours.

Barfoed's reagent for glucose is either a solution of 14 g. crystallized copper acetate in 200 ccm. water and 5 ccm. acetic acid, or, according to a more recent formula, of 0.5 copper acetate in 100 ccm. water and 1 ccm. acetic acid. Glucose reduces this solution in the cold, more quickly upon heating. Dextrin, cane sugar and milk sugar do not reduce the solution. It is used for the distinction between glucose and lactose in urine.

Barreswil's reagent for glucose corresponds to Fehling's solution, but contains potassa in place of soda.

Basoletto's reagent. A mixture of equal parts by volume of sesame oil and a 2 p. c. solution of cane sugar in hydrochloric acid, sp. gr. 1.124, is colored red in the cold, but more rapidly upon heating. With glucose and lactose the color is produced only when the mixture is boiled with the hydrochloric acid and allowed to cool. Compare Baudouin's test.

Baudouin's test for sesame oil. The reagent consists of 0.1 g. sugar dissolved in 10 ccm. hydrochloric acid, sp. gr. 1.18. One volume of this solution is shaken with 2 vol. of the oil to be tested. If sesame oil is present the oil upon separation is cherry-red.

According to *Lewin* the reaction is carried out as follows: 0.5 g. of finely pulverized sugar in a test tube is covered with 2 ccm. of the oil, then 1 ccm. of hydrochloric acid, sp. gr. 1.18, is poured carefully down the sides of the tube. If sesame oil is present a rose-red zone is formed within 1 to 5 minutes.

According to *Millian*, *Baudouin's* test is more delicate when carried out with the well dried free fatty acids, which have been obtained from the oil.

Villavecchia and *Fabris* (q. v.) replace sugar and hydrochloric acid by furfurol. Compare also *Carlinfanti*, and *Gassend.*

Baumann's reagent for polyatomic alcohols and diamines is benzoylchloride added to the solution of the alcohol or amine in aqueous soda. Insoluble benzoyl esters are precipitated. Used for the detection of glycerine, carbohydrates and various products of bacterial activity in urine.

Bayer's reaction for indol. A solution of indol yields upon the addition of dilute nitric acid and dilute solution of potassium nitrite solution a red color or precipitate.

Beale's creosote mixture for imbedding microscopic preparations. To a solution of 180 g. methyl alcohol and 11 g. creosote sufficient chalk is added to make a thick paste. While constantly stirring 1920 g. of water are gradually added, then a few fragments of camphor. After standing several weeks the mixture is filtered.

Bechi's test for cottonseed oil. Upon heating with an alcoholic-ethereal silver nitrate solution cottonseed oil (eventually upon addition of colza oil) yields a reddish-brown color; olive oil and other oils remain uncolored. The Swiss Society for Analytical Chemists in 1895 suggested the following reagent: to 1 g. silver nitrate, dissolved in 5 ccm. of water, 200 ccm. alcohol, 20 ccm. ether and 1 ccm. nitric acid, sp. gr. 1.4, are added. In order to test for cottonseed oil, 10 ccm. of the fat and 3 ccm. of the reagent are mixed and the mixture heated on a boiling water-bath for 10 minutes. If cottonseed oil is present the mixture becomes brown or even black. Compare *Millian's* reaction.

Becker's reaction for picrotoxine. The alkaloid reduces Fehling's solution when gentle heat is applied.

Behren's test for fatty oils. When treated with a mixture of equal parts of sulphuric acid, sp. gr. 1.835 to 1.84, and nitric acid, sp. gr. 1.3, different oils show different behavior. Sesame oil produces a green color.

Beissenhirtz's reaction for aniline. If to a solution of aniline in conc. sulphuric acid a grain of potassium bichromate is added, the solution first becomes red, then blue, the color gradually disappearing.

Berthelot's alcohol reaction. If a dilute solution of alcohol is shaken with a few drops of benzoyl chloride and soda solution until the odor of benzoyl chloride disappears, the peculiar odor of ethyl benzoate is formed.

Berzelius' test for albumen. Metaphosphoric acid in freshly prepared concentrated solution precipitates all albuminous substances (except peptone) from their aqueous solutions.

Bettendorf's test for arsenic. A solution of stannous chloride in concentrated hydrochloric acid, sp. gr. 1.19. when heated with a solution of arsenic or arsenous acids in strong hydrochloric acid, yields a brownish turbidity or precipitate of metallic arsenic and tin. The presence of much sulphuric acid, of oxydizing or organic substances interfere with the reaction.

Bieber's reagent consists of equal parts of concentrated sulphuric acid, red nitric acid and water.

Biel's cocaine test. If a solution of 0.1 g. cocaine salt in 1 ccm. conc. sulphuric acid is heated for several minutes on a water-bath, the addition of several cubic centimeters of water causes the formation of a white, crystalline precipitate of benzoic acid.

Biltz's test for mono- and bicarbonate of sodium. When treated with mercuric chloride under certain conditions, these yield a white or respectively a brown precipitate.

Bischoff's reaction for gallic acid. When heated with dilute sulphuric acid and cane sugar gallic acid produces a red coloration. See also *Pettenkofer, Strassburg.*

Bischoff's melting-point test for butter. See *Drouot's test.*

Boas' reagent is a solution of tropæolin, or paper saturated with such solution.

Bodde's reaction for the distinction between resorcin and phenol, benzoic acid and salicylic acid. A solution of resorcin yields a violet color with sodium hypochlorite, which fades to yellow; with more hypochlorite solution and heat a yellowish-red or brown color is produced. If before the addition of the hypochlorite ammonia is added, a violet color is first produced, which changes to yellow and upon heating is converted into dark green.

Phenol, salicylic acid and benzoic acid yield a slight color with hypochlorite only upon heating. Upon previous addition of ammonia the acids are not colored.

Boedecker's test for albumen. If to a solution containing albumen (e. g. urine), which is acidulated with acetic acid, potassium ferrocyanide is added, a turbidity or flocculent precipitate is produced.

Boettger's (also *Boettcher's*) test for glucose. A dilute solution of glucose (or diabetic urine) is heated with a solution of sodium carbonate and some bismuth subnitrate or bismuth oxyhydrate. If reduction takes place the suspended bismuth compound is blackened. According to *Krueger* a stable reagent can be prepared by heating 15 g. bismuth nitrate, 15 g. tartaric acid, 75 g. water and the addition of sufficient aqueous potassa to effect solution, and some glycerin.

Boettger's test for the red color of wine consists in the addition of 1 vol. of concentrated copper sulphate solution to 3 vol. of wine diluted to ten times its volume. Pure red wine is thereby discolored. Unfermented wine as well as the coloring matter of bilberry, malva, cherries, also fuchsin remain unchanged or are colored violet.

Boettger's reagent for ozone. Filter-paper saturated with solution of gold chloride free from acid is colored violet by ozone. A test paper formerly suggested by *Boettger* contained thallium hydroxide, which was colored brown by ozone.

Boettger's test for sugar in glycerin. 5 drops of glycerin are heated to boiling with 100 drops of water, 1 drop of nitric acid, sp. gr. 1.3, and 0.03 to 0.04 gram ammonium molybdate. If sugar is present the solution is colored intensely blue.

Boettger's reagent for hydrogen peroxide. If to a solution containing hydrogen peroxide a solution of starch cadmium iodide and little ferrous sulphate is added, the blue color of starch iodide is produced. (Also known as *Schoenbein's* reagent.)

Boernstein's test for saccharin. The substance to be tested is extracted with ether. The extract, after the ether has been removed by distillation, is heated with resorcin and sulphuric acid. Then an excess of soda solution is added. If saccharin is present a strong fluorescence is produced. According to *Hooker* other substances, e. g. succinic acid, also produce this reaction.

(To be continued.)

MONTHLY REVIEW.

Pharmaceutical Technique.

Extraction Apparatus according to Fresenius-Offenbach.

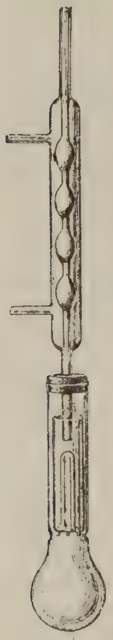

Fig. 1.

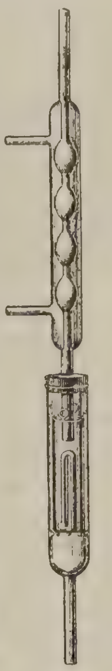

Fig. 2.

The accompanying cuts illustrate a cheap and practical form of an extraction apparatus, which can be used in place of the fragile and expensive Soxhlet.

In Fig. 1 the extraction-chamber, which can readily be removed and is provided with feet so that it will stand, is suspended in the extraction-flask; whereas Fig. 2 represents an extraction-tube, which can be inserted into any flask.

The advantages claimed for this apparatus over the Soxhlet consist in the convenience with which this apparatus can be handled. Both parts are separately replacable. Inasmuch as the extraction-chamber can be removed the substance to be extracted is easily introduced into the apparatus. This also greatly facilitates the cleaning of the parts. The extraction-chambers at present made by Dr. Peters & Rost are of 50 ccm. capacity.

[Neue Laboratoriums-Apparate, Sommer 1896.]

Apparatus for the Preparation of Icepills.

With the aid of the apparatus made by Paul Boehme of Bremen, and illustrated by the accompanying cut, icepills of 16 mm. diameter can be made in 10 to 15 minutes.

After unscrewing the upper cover from the part illustrated by Fig. 1, and removing the outer cylinder, the lower portion to which a tube is fastened remains. The forms represented by Fig. 2 are slipped over this tube in the order in which they are marked. The outer cylinder is then replaced. The water to be frozen to pills is then slowly poured in so that it rises about 3 to 4 mm. over the last form. The apparatus should be shaken somewhat so as to remove any air bubbles that may have formed. For the preparation of pills free from bacteria freshly boiled distilled water is taken, which is previously reduced to a temperature of at least 12 to 15° C. The upper cover is then screwed on so as to hermetically seal the chamber and the whole fastened to the rod and suspended as shown in Fig. 3. The outer chamber is then filled with a freezing mixture of ice and salt. Having rotated the outer chamber occasionally the inner chamber is removed after 10 to 15 minutes and dipped for a moment into hot water. The pills are thereby loosened so that when the forms are taken apart the individual pills drop out. In the absence of ice for freezing purposes a mixture of 3 kilo ammonium nitrate and 3 liter water can be used while repeatedly rotating the outer mantle. The ammonium nitrate can be recovered by evaporation.

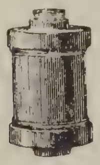

Fig. 1

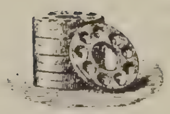

Fig. 2

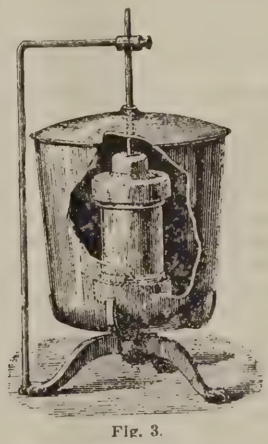

Fig. 3.

[Pharm. Centralh., 37, p. 386.]

Chemistry.

Optical Activity of Tannin.

Hugo Schiff confirms Gunther's statement (Ber. d. pharm. Ges., 5, p. 172), that tannin has a small dextro rotation; he therefore proposes to modify the received constitutional formula of gallic and tannic acids, the latter being represented as a ketonic compound, so that they shall be represented as containing asymmetric carbon atoms.

[J. C. S., 70^{I}, p. 370; from Gazzetta, 25, II, p. 437.]

Synthesis of Vanillin.

By the action of liquid carbonic anhydride at 120° on sodiorthomethoxyhydroxybenzene, according to A. Fajans, a monocarboxylic acid is formed, but at 180°, the dicarboxylic acid $[(COOH)_2:OH:OMe = 1:5:2:3]$ is produced, and, when treated with hydrochloric acid under pressure, it yields methylic chloride and isonorhemispinic acid; when heated alone at 277°, vallinic acid $[OH:OMe:COOH = 4:3:1]$ is produced, and this is converted into vanillin by the action of chloroform and potash.

[J. C. S., 70^{I}, p. 369; from Chem. Centr., 1895, II, p. 567.]

Production of Gaseous Formaldehyde.

The incomplete combustion of methylalcohol yields only a small quantity of formaldehyde, accompanied by a large quantity of water and a notable proportion of carbonic oxide. The preparation of the gaseous aldehyde for purposes of disinfection is best accomplished according to André Brochet, by passing a current of hot gas over coarsely powdered trioxmethylene. The dilution of the aldehyde prevents repolymerization, and the absence of water vapor makes it possible to apply the method to the disinfection of books, papers, and other articles that would be injured by moisture.

[J. C. S., 70^{I}, p. 345; from Compt. rend., 122, p. 201.]

Preparation of Bromo- and Iodo-Hæmol.

E. Merck has had these two compounds patented. A solution of blood, which has been deprived of the coating of the corpuscles, is precipitated with an alcoholic solution of bromine, respectively iodine. If necessary alkali is added to neutralize any formed acid. The bromine and iodine are chemically combined with the hæmol, but are readily given off in the organism. They are to be used medicinally. [Ber. 29, Ref., p. 529.]

A new Method for the Separation of the Methylamines.

According to M. Delépine, formic aldehyde can be used for the separation of the methylamines. Monomethylamine, according to Henry, forms the compound $(CH_2{:}N.CH_3)_3$, boiling at 166°; dimethylamine the compounds $CH_2{<}\begin{matrix}OH\\N(CH_3)_2\end{matrix}$, and $CH_2[N(CH_3)_2]_2$, boiling between 80—85°; whereas trimethylamine, as was to be expected, does not react. The mixture of the three methylamines, whose boiling points lie close to each other, are thus converted into compounds, whose boiling points are far apart. The primary and secondary amine are regenerated from their respective condensation products by boiling them with alcoholic hydrochloric acid. [Ber. 29, Ref., p. 520; from Compt. rend. 122, p. 1064.]

On the action of Unorganized Ferments.

As is generally known, the course of hydrolytic reactions is hastened by the presence of hydrogen and hydroxy ions. Besides these there are principally substances of unknown constitution, known as unorganized ferments or enzymes, which have the same hastening action. However, not every hydrolysis is hastened by every ferment. These stand in the same position to acids as special reagents do to group reagents. The ferments themselves do not remain unchanged during the course of the reaction. G. Tamman has ascertained indirectly that for dissolved emulsin — by the action on salicin and subsequent titration with Fehling's solution—at temperatures above 50° its capacity for hydrolysis may be expressed by a mono molecular reaction. Below 50° other causes must be acting as well, possibly bacteria. At higher temperatures solid emulsin appears to lose its capacity for hydrolysis according to the mono-molecular formula.

[Ber. 29, Ref., p. 482; from Z. physik. Chem., 18, p. 426.]

Metaplumbates.

Of the salts of metaplumbic acid the potassium salt, $PbO_3K_2+3H_2O$ of Fresny, has been known for some time. About two years ago M. Hoehnel[1] reported on a simple method for the purification of the unstable sodium salt, $PbO_3Na_2+4H_2O$. He also converted the normal salt into the acid salt, $PbO_3HNa+3H_2O$, and later prepared the stable calcium metaplumbate, PbO_3Ca+4H_2O.[2] With the aid of the levigated calcium salt he has now prepared metaplumbates of the heavy metals by double decomposition with the normal acetates of these metals.

The zinc salt constitutes a reddish-brown crystalline powder and has the formula PbO_3Zn+2H_2O. The copper salt is a dark-black powder of the formula PbO_3Cu, the manganese salt is a grayish-black crystalline powder. The lead salt, PbO_3Pb, is identical with the sesquioxide, Pb_2O_3 of Winkelblech[3] and possesses the same color as that obtained by Jacquelain,[4] who precipitated a solution of minium in glacial acetic acid with ammonia.

Hoehnel believes that soluble salts of other heavy metals will behave like those of copper, zinc, manganese and lead toward calcium metaplumbate. Barium, magnesium and strontium salts, however, could not be prepared in this way. [Arch. d. Pharm., 234, p. 397.]

On the Action of Morphine and Acetanilid on a Mixture of a Ferric Salt and Potassium ferricyanide.

Among the so-called "characteristic" reactions for morphine based on the reducing power of this alkaloid, the reaction with the above mentioned mixture has received different chemical interpretation. Armitage[5] has claimed that the principal reaction consists in the reduction of the ferric salt by the morphine and that the ferro salt thus formed reacts with the ferricyanide to form Trumbull's blue.

On the other hand O. Hesse[6] claims that morphine in dilute solution does not reduce the ferric salt, but the ferricyanide and that the ferrocyanide thus obtained produces Prussian blue with the ferric salt. The morphine is at the same time oxydized to oxymorphine.

Schaer, however, claims that one reaction does not take place to the exclusion of the other, but that both take place side by side although the reaction described by Hesse predominates. For the details of Schaer's investigation the reader must be referred to the original. Acetanilid, which likewise reduces the mixture of ferric salt and potassium ferricyanide, and in this respect resembles morphine, but differs from this alkaloid in some of the details of the reaction.

[Arch. d. Pharm., 234, p. 348.]

A New Reagent for Alkaloids.

A solution of sodium vanadinate in water acidulated with acetic acid is suggested as a new reagent for alkaloids by Adam Jawowroski. An addition of a copper salt increases the sensibility of the reagent, which can be prepared in the following manner: 0.3 g. of sodium vanadinate are dissolved with the aid of heat in 10 cc. of distilled water. The same amount (0.3) of crystallized copper sulphate is likewise but separately dissolved in 10 cc. of water. The cold solutions are mixed and sufficient concentrated acetic acid (about 7–8 drops) is added to redissolve the precipitate of copper vanadinate. After filtration the greenish yellow solution is ready for use.

Thebaine, beberine, nicotine, aconitine, strychnine, quinine, quinidine, cinchonine, cinchonidine, brucine, emetine, and apomorphine produce precipitates in 0.0x to 0.00x p. c. solutions.

Morphine, sparteine, papaverine, atropine, narcotine, codeine, cocaine and hyoscine produce precipitates in 0.x p. c. solutions within 10 to 60 seconds.

Caffeine, colchicine, coniine, cotoine, narceine, pilocarpine, piperine, solanine, theobromine and veratrine do not produce precipitates or only in concentrated solutions.

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[1] Arch. d. Pharm., 232.

[2] Ibidem, 233.

[3] Annalen, 21, p. 21.

[4] Ibidem, 91, p. 235.

[5] Pharm. Journ. and Trans. [III], 18, p. 761.

[6] Ibidem, p. 801.

Salts of the alkaloids are dissolved in 4 to 5 cc. of water; free alkaloids with the acid of dilute acetic acid (1:18). [Pharm. Zeitsch. f. Russl., 35, p. 326.]

Estimation of Alkali Benzoates.

According to G. Rebière the base is estimated by adding to the substance hydrochloric acid in excess, heating on the water-bath until all free acid is removed, and titrating the residual chloride by means of $\frac{N}{10}$ silver nitrate solution. The benzoic acid is determined in a second and equal portion, which is dissolved in water (50—60 cc.), and sulphuric acid ($\frac{N}{10}$) added, in the exact quantity needed to combine with the metal; the liberated benzoic acid is then titrated with $\frac{N}{10}$ soda, phenolphthaleïn being used as indicator. With normal benzoates, the quantity of soda required is equal to that of the sulphuric acid employed, whilst with basic and acid salts, it is less and more respectively. After proving the accuracy of this method, the author investigated the composition of various benzoates employed in pharmacy. Sodium benzoate crystallizes with $1H_2O$, and is usually tolerably pure; the potassium salt contains $3H_2O$, and generally has an acid reaction; the lithium salt contains $1H_2O$, its analysis requires care to avoid loss of lithium chloride; whilst the ammonium salt is anhydrous: the ammonia is estimated by boiling with excess of the above soda solution, and titrating with sulphuric acid.

[J. C. S., 70^{II}, p. 396; from J. Pharm. [6], 3, p. 113.]

Ricinine.

Ricinine, $C_{17}H_{18}N_4O_4$, is the poisonous principle of the castor oil seeds. According to Marco Soave the pressed seeds yield 0.3 p. c., whereas the husks yield 1.5 p. c. of ricinine. To obtain the ricinine, the pressed seeds or husks are extracted with boiling water, the extract evaporated on the water bath, and the residue treated with alcohol. The alcoholic solution is then evaporated to dryness and the residue treated with caustic soda; by this means, the impurities are dissolved out, and the ricinine which remains behind may be crystallized from alcohol or water. It crystallizes in glistening plates, melts at 194°, has a bitter taste, is readily soluble in water, alcohol, chloroform, benzene, and ether; the aqueous solution is neutral and optically inactive. Ricinine may be sublimed when carefully heated; it is soluble in concentrated sulphuric acid, yielding a colorless solution, which becomes straw-yellow, and then bright scarlet red, on warming. The colorless sulphuric acid solution gives, with a crystal of potassium dichromate, a bright green coloration; the author suggests this as a test for ricinine. Ricinine does not give the usual tests for alkaloids, neither does it form salts with strong mineral acids; it yields a bromo derivative, $C_{17}H_{16}Br_2N_4O_4$, which melts at 247°, and a corresponding chloro derivative, which melts at 240°. With mercuric chloride, it yields the compound $C_{17}H_{18}N_4O_4.3HgCl_2$, which melts at 204°. When oxidized, it yields a new acid, $C_{15}H_{14}N_4O_4$, which the author terms ricinic acid; the same acid may also be obtained by the hydrolysis of ricinine with caustic soda. It is a dibasic acid, which melts at 295°, yields a silver salt, a barium salt crystallizing with $4H_2O$, and a bromo derivative, $C_{15}H_{12}Br_2N_4O_4$, melting at 180°.

[J. C. S., 70^{I}, p. 386; from Chem. Centr., 1895, I, p. 853; from Am. Chim. Farm. 21, p. 49.]

Derivatives of Phenetidine. [Paramidophenetoïl.]

S. Wenghoeffer has prepared a number of compounds more or less closely related to acetparaphenetidine or phenacetine.

Benzylparamidophenetoïl, $OEt.C_6H_4.NH.C_7H_7$, is prepared by warming a mixture of benzylic chloride and paramidophenetoïl (2 mols.) and extracting the product with ether. It crystallizes in leaflets, and melts at 45—46°, dissolves in alcohol, chloroform, and ether, but is insoluble in water. It dissolves without decomposition in hot sulphuric acid, and is not attacked by hot alkalis. It appears to be a valuable febrifuge.

Parethoxyphenyloxamide, $C_2O_2(NH.C_6H_4.OEt)_2$, formed by the condensation of oxalic acid and phenetidine (2 mols.) at 140—145°, crystallizes in needles and melts at 263°; it is sparingly soluble in alcohol, benzene, and chloroform, but dissolves readily in acetic acid. Hot caustic soda decomposes it into phenetidine and sodium oxalate. It does not yield an acetyl derivative, being split up into carbonic oxide and paracetamidophenetoïl when heated to 200° with acetic anhydride. It is not poisonous.

Paramidophenetoïl mandelate forms shining crystals, which dissolve readily in alcohol and hot water, and melt at 105°. When it is heated at 130—170°, water is eliminated, and amygdalyl-4-amidophenetoïl, $OEt.C_6H_4.NH.CO.CHPh.OH$ is formed; this crystallizes from 60 p. c. alcohol in white, shining leaflets, dissolves sparingly in hot water and ether, and melts at 140.5°. It is stable towards dilute alkalis and acids, but is decomposed by strong sulphuric acid. Both this compound and its acetyl derivative have antipyretic and antiseptic properties. The latter substance melts at 154°, dissolves readily in alcohol and in acetic acid, but is only sparingly soluble in ether and hot water; it is readily hydrolysed by alkalis.

Ethylic acetoacetate condenses very readily with paramidophenetoïl to form ethylic-β-phenetidylcrotonate. When heated quickly to 225—240°, alcohol is eliminated, and the product consists almost entirely of 4^1-hydroxy-4-ethoxy-2^1-methylquinoline, $OEt.C_9NH_4\text{-}Me.OH$. This crystallizes from absolute alcohol in silky, white leaflets, dissolves with difficulty in cold water and ether, more readily in hot water, and is very soluble in alcohol. It forms salts with acids. The hydrochloride, $C_{12}H_{13}NO_2.HCl$, crystallizes from alcohol in slender, felted needles; the platinochloride in brittle, yellow crystals. It has a bitter, not unpleasant taste, and has strongly marked antipyretic properties.

[J. C. S., 70^{I}, p. 360; from Chem. Ztg. 1895, 1753.]

Botany and Pharmacognosy.

Amorphous Cinchona Alkaloids from Leaves.

Sertuerner, the discoverer of morphine, isolated from calisaya bark an amorphous alkaloid, which he called "chinoïdin". He also pointed out that it can be precipitated from the mother-liquids of the quinine factories upon the addition of alkali. In a more or less purified form it is brought into the market as quinoidine.

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Whereas Pasteur supposed this quinoidine to be a decomposition product of the crystallizable alkaloids, de Vrij, after fifty years of study and investigation, holds an opinion that is diametrically opposed to the views of Pasteur. He believes that quinine and the other crystallizable alkaloids are formed from the quinoidine. The change, he says, takes place in the leaves from which he was able to isolate the mixture of amorphous alkaloids known as quinoidine, but no crystallizable alkaloid. In order to ascertain definitely the absence of crystalline alkaloid Prof. Behrens at his request examined microscopically the precipitate resulting upon the application of the herapatite test. Neither the one nor the other crystalline herapatite could be detected. The leaves examined were those of *Cinchona ledgeriana* from the Dutch plantations. The alkaloids were extracted by means of the lime process. For details of the process the original will have to be consulted.

[Schw. Wochensch. f. Chem. u. Pharm., 34, p. 200; from Nederl. Tijdsch. voor Pharm., Chem. en Toxicol., 1896.]

Preparation of Quinic Acid.

According to de Vrij finely powdered cinchona bark is extracted with distilled water by maceration and percolation, air being excluded as much as possible. The slightly colored liquid is evaporated in vacuum to a thin syrup. To this 95 p. c. alcohol is added under continuous stirring as long as a precipitate is produced. The white calcium cinchotannate colored more or less by cinchona red thus obtained is kneaded with alcoho and then dissolved in water. A slight excess of calcium hydroxide is added and the mixture boiled and evaporated to dryness. The cinchotannic acid is thereby converted into cinchona red. The resulting calcium quinate is extracted with water and purified by crystallization. The free acid is obtained by precipitating the calcium from the solution as oxalate. Succirubra bark yielded on an average 10—11 p. c. of crude calcium cinchotannate, whereas American bark yielded much less.

[Schw. Wochensch. f. Chem. u. Pharm., 34, p. 198; from Nederl. Tijdsch. voor Pharm., Chem. en Toxicol., 1896.]

Palmarosa Oil.

The oil of *Andropogon Schoenanthus* L., Nat. Ord. *Gramineæ*, has been repeatedly examined, but often the material was of rather doubtful origin. On account of the commercial importance of this oil, a further examination was made by E. Gildemeister and K. Stephan, which was based on numerous observations made in the laboratories of Schimmel & Co.

The action of commercial specimens on polarized light varied from $+1° 40'$ to $-1° 55'$. A rotatory power of $+39°$, as given in the Pharmacographia Indica, was never observed. All of the specimens were soluble in three parts of 70 p. c. (by volume) alcohol. Adulterations with cedar oil, Gurjun balsam, turpentine oil, cocoanut oil and paraffin oils can thereby be readily detected. A second grade oil is brought into the market as gingergrass oil, which is almost always adulterated.

The amount of free geraniol in four oils was found to vary from 68.23 to 83.15 p. c.; that of geranyl ester from 8.48 to 13.35 p. c.; that of total geraniol from 76.9 to 91.63 p. c. In the esters geraniol is combined with acetic and normal capronic acids. There is further present about 1 p. c. of dipentene and probably traces of methyl heptenone. Tests for terpinene and phellandrene gave negative results.

[Archiv d. Pharm., 234, p. 321.]

Chelidonium Alkaloids.

According to N. A. Orloff chelerythrine is contained in all parts of the fresh specimens of *Chelidonium majus*, but none could be extracted from the dried plants. The fruit contains 0.06 p. c., and the root 0.001 to 0.005 p. c. of the alkaloid. The plant is extracted with water containing a little sulphuric acid, the extract treated with potassium carbonate, and the washed and dried precipitate extracted with ether; the alkaloid is then converted into the yellow, oily sulphate, and this is decomposed by means of ammonia. The hydrochloride is orange-yellow, but the base is colorless.

Chelilysine is present both in the fresh and dried plants; these are extracted with water, the solution treated with soda, and the filtrate precipitated with tannin; the dried precipitate is then extracted with alcohol, the solution acidified with hydrochloric acid, and the hydrochloride further purified. It gives precipitates with platinic chloride, auric chloride, phosphotungstic acid, phosphomolybdic acid, and potassio bismuth iodide. The yield of hydrochloride is 0.007 p. c. The base is amorphous and almost insoluble in chloroform and ether.

[J. C. S., 70^{I}, p. 396; from Chem. Centr., 1895, II, p. 226; from Pharm. Zeitsch. Russ., 34, p. 369.]

Polystichic Acids.

C. Paulsson has obtained two new acids from the rhizomes of *Polystichum spinulosum*, taken in the autumn. One of these is polystichic acid, $C_{22}H_{24}O_9$, which melts at 123—123.2°; it is insoluble in water, readily soluble in chloroform, ether, and benzene, and crystallizes in yellowish needles. The second acid is dihydropolystichic acid, $C_{22}H_{26}O_9$, which crystallizes in white, granular masses or colorless needles, and melts at 150°. The two acids are best separated by crystallization from acetone and then by treatment with chloroform and methyl alcohol. Both are poisonous, and resemble filicic acid in their physiological action. The total dose for frogs is 2 m. g., for rabbits 0.03 to 0.05 g. per kilo of body weight.

[J. C. S., 70^{I}, p. 387; from Chem. Centr., 1895, I, p. 887; from Arch. Exp. Path. Pharm., 35, p. 97.]

Morin.

The yellow coloring matter, morin, exists, as has been known for some time, in old fustic, the wood of *Morus* or *Maclura tinctoria* and has lately been shown by Perkin & Cope (Trans. Ch. Soc. 67, p. 937) to be also present in the Indian dyestuff "Jackwood" *Artocarpus integrifolia*. When pure it appears as glistening, almost colorless needles, soluble in alkalis with yellow coloration, and yielding, with aluminium mordants, very beautiful bright yellow shades.

This substance has been examined chemically by a considerable number of investigators, recently again by H. Bablich and A. G. Perkin, who state that morin may be considered as quercetin, in which the catechol nucleus has been replaced by resorcin.

[Journ. Chem. Soc., 69, p. 792.]

Practical Pharmacy.

Extraction of Vegetable Drugs under Pressure with Carbonic Acid.

Into the menstruum surrounding the drug carbon dioxide is passed under pressure. If necessary the mixture is heated. Then the pressure is rapidly removed. The carbonic acid, which has diffused into the drug, thereby affects a rupture of the tissues so that extraction may be complete. The process has been patented by H. Deininger of Berlin.

On the Preparations of Strophanthus.

The United States Pharmacopœia of 1890 recognizes only one preparation of the important drug strophanthus, namely, the tincture. Inasmuch as in practice it is often desirable to give strophanthus with other drugs in pill form, H. C. Wood and W. S. Carter have made a physiological examination of the extract obtained upon evaporation of the tincture and of commercial strophanthin. The experiments made upon dogs only led the authors to the conclusion that the strophanthin is superior to the extract in "raising the arterial pressure" and that, therefore, this active principle of strophanthus should be recognized by the Pharmacopœia. [Am. Journ. Pharm., 68, p. 353.]

The Detection of Acetanilid in Some Closely Related Synthetical Compounds.

Frank X. Moerk has tested the applicability of E. Hirschsohn's test for acetanilid in phenacetine and more or less closely related compounds. Hirschsohn claims that five percent or more can readily be identified by making a saturated aqueous solution, and adding to this half a volume of bromine water. Antifebrine decolorizes the bromine water immediately, and in a few moments a crystalline precipitate appears. Phenacetine, on the other hand, is stated neither to decolorize the bromine nor form a precipitate. Moerk finds that lactophenine, exalgine and phenocoll likewise produce precipitates, so that the reaction is not very characteristic for acetanilid. Differences, however, exist with regard to the solubility of the precipitates in petroleum ether.

The isonitrile test as applied by others gives results which can be improved upon by the addition of potassium permanganate. Acetanilid gives the characteristic isonitrile odor, phenocoll gives a faint odor but different from the isonitrile, whereas the others, when pure, yield tests destitute of odor.

"0.1 gm. of methacetine, phenacetine, lactophenine, salophenen or phenocoll hydrate are boiled with 10 cc. of water (salophen is the only one not soluble in 10 cc. boiling water); then cooled quickly by immersion in cold water and filtered through cotton. To 2—3 cc. of the filtrate add an equal volume of 5 p. c. solution of potassa (or soda), boil and add small fragments of potassium permanganate until the green color first produced gives way to a violet or purple after boiling; then add two or three drops of a mixture made of chloroform 10 cc., alcohol 10 cc. and water of ammonia 0.5 cc.; boil and again add some of this mixture if the permanganate has not been reduced completely to brown manganic hydrate; after the chloroform has vaporized by standing a few moments, note the odor and compare it, if doubtful, with that yielded by a dilute acetanilid solution. In testing exalgine omit the potassium permanganate."

[Am. Journ. Pharm., 68, p. 389.]

A New Mineral water.

Saratica "Bitterwasser", according to Dr. S. Habermann, has the following mineral constituents in every 1000 parts:

Sodium chloride	1.3511
Sodium sulphate	17.9203
Magnesium sulphate	18.9291
Potassium sulphate	0.8575
Magnesium carbonate	1.2574
Strontium and lithium sulphate	0.0050
Silicic acid	0.0161
Total	36.3365

[Pharm. Post., Vol. 29, p. 235.]

"Eluendin": an Emulsion of Benzin and Petroleum Ether.

According to A. v. Sztánkay the cleansing power of an emulsion of the low boiling fractions of petroleum is much greater than that of the hydrocarbons pure and simple. A specialty sold in Hungary as "Seifenmilch" proved to be such. For the preparation of the emulsion he recommends the following formula:

About 3 grams of soap are dissolved in 50 to 60 grams of lukewarm distilled water and the solution poured into a two liter flask. The mixture of benzin and petroleum ether is gradually added while thoroughly shaking the contents of the flask. If the emulsion is slow in forming, the entire flask can be placed in a warm waterbath, or 50 to 100 grams of water of a temperature from 60 to 80° can be added with renewed shaking. From 1000 to 1500 grams of hydrocarbons can be emulsified with only 3 grams of soap. The emulsion is thick and must be set aside for several days, after which time the excess of water separates.

[Pharm. Post, 29, p. 281.]

Preparation of Pure Strontium Salts.

S. P. S. Soerensen discusses in considerable detail the tests for calcium and barium in strontium compounds and the separation of the alkaline earths from each other. New proof is brought to the already well known fact that the separation becomes much more difficult if the compounds are isomorphic. Those who wish to make use of Soerensen's results will have to consult the original. Attention may briefly be called to the method used for the preparation of pure strontium salts.

Commercial strontium carbonate is dissolved in as little hydrochloric acid as possible. Strontium hydrate is added to make the solution alkaline and chlorine is passed into it, the solution again slightly acidified with hydrochloric acid and most of the barium precipitated as barium chloride by means of the requisite amount of concentrated hydrochloric acid. Barium and strontium are now precipitated as sulphate, these are converted into the carbonates by means of the ammonium salt, the resulting carbonates are dissolved in nitric acid and the barium precipitated fractionally with sulphuric acid. The filtrate is evaporated to a magma and this is treated repeatedly with alcohol until the purified strontium nitrate is free from calcium. The strontium salt thus obtained does not contain traces of barium or calcium. The yield from the commercial carbonate is about 75 to 77 p. c.

[Ber. 27, Ref., p. 486; from Z. anorg. Chem., 11, p. 305.]

Phosphorergot.

With this name Luton has baptized a mixture of sodium phosphate and ergot, which is not recommended as a specific against any particular disease, but as a general tonic.

The liquid form is a mixture of 5 g. of tincture of ergot and 1.50 g. of sodium phosphate, given as a single dose.

The powder, *pro dosi*, consists of 0.25 g. of each of powdered sodium phosphate and ergot.

The pills contain each 0.1 sodium phosphate and ergotine.

[Apoth. Ztg., 11, p. 485; from Journ. de méd. et de chir.]

Magnesium Paste.

Dr. Vergil recommends a mixture of calcined magnesia and milk formed into a paste as an excellent coating for burns. A thick layer of the paste is applied and supplemented several times daily.

[Apoth. Ztg., 11, p. 485.]

Physiology.

On Kreatinine from Different Sources.

The question whether kreatinine from different sources is identical or isomeric has been suggested by G. S. Johnson,* who also experimentally investigated the subject. He came to the conclusion that kreatinine prepared directly from urine differed from that regenerated from kreatine. Both he supposed differed from that obtained from meat kreatine. Differences in crystal form, in the platinum double salt etc. were pointed out.

The entire question of identity or isomerism has been submitted to a thorough examination by M. Toppelius and H. Pommerchul in the laboratory of Prof. E. Schmidt. A comparative study of kreatinine from urine, meatkreatinine, synthetic kreatinine and kreatinine obtained from kreatine was made. They all appear to be identical. The differences observed by others are referred to impurities or differences in the conditions under which the investigation was conducted. Thus, e. g., kreatinine crystallizes free from water from mother-liquids rich in hydrochloric acid, but upon spontaneous evaporation of the aqueous solution hydrated crystals were obtained.

[Arch. d. Pharm., 234, p. 380.]

Literary.

Books and Pamphlets Received.

The Macmillan Company — New York. The practical methods of organic chemistry. By Dr. Ludwig Gattermann, a. o. professor in the University of Heidelberg. Translated by Dr. William Schober, instructor in organic chemistry in the Lehigh University. One vol., pp. XII, 330, with numerous illustrations. 1896. $1.60.

A. Hartleben's Verlag — Wien. Allgemeine Waarenkunde. Handbuch für Kaufleute und Gewerbetreibende. Unter Mitwirkung von Fachgenossen, redigirt von Dr. Josef Bersch.

2. Lieferung: Baccae — Boullearbeiten, pp. 49—96;

3. Lieferung: Bourbonthee — Chromoxyd, pp. 97—144;

4. Lieferung: Chromoxyd — Eis; pp. 145—192. 1896. Lieferung @ M. 0.50.

Tausch und Grosse—Halle a. S. Historische Studien aus dem Pharmakologischen Institute der Kaiserlichen Universität Dorpat. V. Herausgegeben von Dr. Rudolf Kobert, Professor der Geschichte der Medicin und der Pharmakologie. Ein Bd., pp. XV, 324. 1896. M. 12.00.

Julius Springer — Berlin. Vierteljahresschrift über die Fortschritte auf dem Gebiete der Chemie der Nahrungs- und Genussmittel, der Gebrauchsgegenstände sowie der hierher gehörenden Industriezweige. Unter Mitwirkung von Fachgenossen, mit der Redaktion beauftragt: Dr. A. Hilger. Elfter Jahrgang. Das Jahr 1896. Erstes Heft, pp. 160. 1896.

Wilhelm Englemann — Leipzig. Die natürlichen Pflanzenfamilien, nebst ihren Gattungen und wichtigeren Arten, insbesondere den Nutzpflanzen. Unter Mitarbeit zahlreicher hervorragender Fachgelehrten. Herausgegeben von A. Engler. Lieferungen 136 bis 139. 1896.

R. Gaertner's Verlagsbuchhandlung — Berlin. Chemisch-technisches Repertorium. Uebersichtlicher Bericht über die neuesten Erfindungen, Fortschritte und Verbesserungen auf dem Gebiete der technischen und industriellen Chemie mit Hinweis auf Maschinen, Apparate und Literatur. Herausgegeben von Dr. Emil Jacobsen. 34. Jahrgang. 1895. Zweites Halbjahr. Zweite Hälfte, Schluss. Mit in den Text gedruckten Illustrationen, pp. 185—456.

Author — Beiträge zur Kenntniss der neueren Droguen Cortex Comocladiae integrifoliae, Cortex Oroxyli indici und Euchresta Horsfieldii Benn. Inaugural Dissertation zur Erlangung der Doktorwürde der hohen philosophischen Fakultät der kgl. bayr. Friedrich-Alexanders-Universität Erlangen vorgelegt von Otto Werner aus Wiesbaden. Pamphlet, pp. 56, mit 6 Tafeln. 1896.

Author — Ueber einige neue Abkömmlinge des Terpineols. Inaugural-Dissertation zur Erlangung der Doktorwürde, der hohen philosophischen Fakultät der Georg-Augusts-Universität zu Göttingen, vorgelegt von Henry Vinecome Arny aus New Orleans, La. Pamphlet, pp. 38. 1896,

Author — Soil Ferments Important in Agriculture. By. H. W. Wiley. Reprinted from the Yearbook of the U. S. Department of Agriculture for 1895. Pamphlet, pp. 44.

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* London, Proceedings of the Royal Society, 63, p. 493.

Author — Hydro-Galvanism of the Urethra. By Robert Newman, M. D. Reprinted from Transactions of Electro-Therapeutic Association. Pamphlet, pp. 8.

Author — Aluminum Alcoholates. By. H. W. Hillyer. Reprint from Am. Chem. Journ. Leaflet, pp. 2.

U. S. Dept. of Agriculture — Washington. Tumbling Mustard. (*Sisymbrium altissimum.*) Circular No. 7. Division of Botany. Leaflet, pp. 8.

McKesson & Robbins — New York. Clinical Reports on Diuretin-Knoll. Pamphlet, pp. 16.

Reviews.

Historische Studien aus dem Pharmakologischen Institute der Kaiserlichen Universität Dorpat. Herausgegeben von Dr. Rudolf Kobert, Professor der Geschichte der Medicin und der Pharmakologie. Bd. V, pp. XV, 324. Tausch und Grosse, Halle a. S. 1896. M. 12.00.

In the study of the history of civilization the history of science and of the sciences has long been neglected. In chemistry and botany, for example, there are but few works exclusively historical. It is only within the last five or ten years that at German universities the professors of chemistry seem to have awakened to the realization that the history of their science is not only one of the most interesting courses of their curriculum, but from an educational and cultural standpoint also one of the most important.

The number of historical treatises on the art and science of medicine is much larger. The present year has to record the establishment of a chair of the history of medicine at the University of Wuerzburg and also of an International Archive for the History of Medicine and Medical Geography to be published in Amsterdam. The study of the history of the natural sciences apparently is enjoying a renascence at the close of this century.

Among the works that have helped in bringing about this revival in historic interest in medicine and pharmacy the Historische Studien, which have issued from the University of Dorpat under the editorship of Prof. Kobert, will always occupy a prominent position. The first four volumes, which have appeared, have all been favorably reviewed in the earlier volumes of this journal. The fifth volume, which now lies before us is particularly rich in interesting material. It is impossible to compress into the space of a review even a brief description of the character of the articles contained therein. An enumeration of the articles, however, will sufficiently indicate what may be expected by the perusal of the pages of the fifth volume.

I. Das Receptbuch des Scribonius Largus, zum ersten Male ins Deutsche übersetzt und mit pharmakologischem Kommentar versehen von Felix Rinne.

II. Ueber den Kwass. Zur Einführung desselben in Westeuropa, von Rudolf Kobert.

III. Zur Geschichte des Bieres. Von Rudolf Kobert.

IV. Die normale und pathologische Anatomie des Talmud. Von L. Razenelson, ins Deutsche übersetzt von N. Hirschberg.

A detailed table of contents and an index of not less than twenty-seven double column pages add greatly to the value of the book for historic study.

In order to remove any suspicion that the book is solely of interest to physicians and not to pharmacists, because the author is professor of the history of medicine it ought to be sufficient simply to recall the fact that in their historical development medicine and pharmacy have been so closely related that what pertains to one cannot be devoid of interest to the other.

Attention, however, may be called to a few facts taken from the first article before us. After the specimen translation of the preface and of chapters I—LXXIX of the Receptbuch the author comments on the contents of the entire work. Under separate headings he discusses the forms of medicine used internally; those used semi-internally ("halbinnerlich"), such as gargles, suppositories etc; lastly those applied externally. The weights and measures occuring in the text are next enumerated. The enumeration and commentary on the drugs of the text include 242 vegetable drugs, 36 mineral drugs and 27 animal drugs: Lastly the cases of poisoning mentioned by the author are enumerated.

It may be of interest to add that little is known about the person of Scribonius. He mentions in his own work that he was busy with the collection of formulas at the time of the emperor Tiberius. The Compositions are supposed to have been written between the years 43 and 48.

It, therefore, becomes apparent that the volume contains an abundance of matter of interest to the pharmaceutical student. The study of the history of pharmacy is more important than ever. Nothing, not even the thorough study of the sciences, will counteract the present tendency towards commercialization more effectively than an acquaintance with the history of our art and science. The practice of our calling will thereby be not only the means toward an end, but become an end in itself. *E. K.*

Meyer's Conversations Lexicon. Ein Nachschlagewerk des allgemeinen Wissens. 5te, gänzlich neubearbeitete Auflage. Zwölfter Band. Mauria-Nordsee. Verlag des Bibliographischen Instituts, Leipzig und Wein. 1896.

Der vorliegende Band ist textlich, sowie illustrativ ein besonders reichhaltiger und interessanter, und umfasst in der Reihe grösserer Artikel eine Anzahl naturwissenschaftlich besonders beachtenswerther Monographieen und neuer vorzüglicher Farbendrucktafeln. Von den ersteren möge auf folgende als Musterleistungen aufmerksam gemacht werden:

Naturwissenschaftlich: Medusen, Meere, Meer-Fauna und Flora, Metalle, Meteorologie, Meteorsteine, Methylverbindungen, Metrik, Milch, Mimicry, Mineralien, Mittelmeerflora, Moleculargewicht, Mond, Moose, Nachtthiere, Muskeln, Nagethiere, Naturforschung, Nebel, Neotropische Fauna, Nahrungsmittel, Nahrungspflanzen, Nerven. Heilkunde: Medicinalwesen, Medicin, Naturheilkunde, Nervenkrankheiten. Technisch: Meerinstrumente, Microscope, Möbel, Mosaik, Nähmaschine. Kulturhistorisch: Medaillen, Mensch (Rassen und Völkerschaften), Metallzeit, Militairwesen, Miniatur, Missionswesen, Münzwesen, Museen, Musik, Mythologie, Nordamerikanische Literatur, Nordische Kultur. Geographisch: Mexico, Minnesota, Missouri, Mittelmeer, Montenegro, Moskau, München, Münster, Neapel, Neuguinea, Neuseeland, New Hampshire, New Jersey, New Mexico, New York, Niagara, Niederlande, Nil, Nord Carolina, Nordpol und Nordpolarländer, Nordsee, von hervorragender Schönheit und Güte sind auch die in reichlicher Fülle in dem Bande enthaltenen schwarzdruck, lichtdruck und Kartographischen Illustrationen, von denen eine Anzahl ganz neu sind, z. B. die Tiefsee Fauna, die Gestalt des Menschen, Moose, Medaillen, Meridiankreis, Microscope, Mittelmeer Fauna, Mondansichten, Münchener Neubauten, Münzen, Nordische Kultur.

Die Möglichkeit einer so gründlichen, textlichen und vorzüglichen illustrativen und künstlerischen Herstellung von Meyer's Conversations Lexicon bekunden vollauf die allgemeine Anerkennung und Geltung dieser hervorragenden Leistung auf den Gebieten der Literatur und der Kunsttechnik des deutschen Verlagsgewerbes. Ein derartiges Unternehmen und ein so bestandkräftiger Erfolg sind auch nur in einem Institut möglich, welchem ein gewaltiges Betriebsmaterial und Kapital zur Verfügung stehen und welches in seinem ganzem Umfange unter mustergültiger, sachkundiger und wohl disciplinirter Organisation und Leitung steht.

Fr. H.

Yearbook of the United States Department of Agriculture 1895. One vol., pp. 656. Washington: Government Printing Office. 1896.

Reports from the Department of Agriculture have been published since 1849, but the present volume is only the second of its kind. The executive and business report of the Department is now printed separately and the second part of this report made up of papers from the Department bureaus and divisions, "specially suited to interest and instruct the farmers of the country" now constitutes the Yearbook. All that could be done last year was to separate the papers submitted and to publish them in the new form. This year special attention has been given in the make-up of the papers to the purpose for which the volume is designed.

The Yearbook consists of three parts:

1.) A general report of the operations of the Department during the year, by the Secretary of Agriculture.

2.) A series of papers from the different bureaus and divisions of the Department, and from some of the experts of the agricultural experiment stations, discussing in a popular manner the results of investigations in agricultural science or new developments in farm practice. These papers are presented in the form of popular essays rather than scientific reports, and with the object of making them attractive as well as instructive they are illustrated as fully as possible. As the years go on the Department hopes, in successive issues of this work, to give farmers a good library covering the applications of science to practical agriculture.

3.) An appendix of miscellaneous information such as agricultural statistics, tables, recipes etc.

Although the work is written especially for the farmer this need not imply that the contents are not of interest to others. The very first paper e. g. "Soil ferments important in agriculture" by Prof. Wiley will be found instructive to any person who takes an interest in nature.

To the pharmacist who has been dissatisfied with the too technical character of pharmaceutical yearbooks this volume will be very instructive by way of comparison. If a happy mean could be struck between the present style of pharmaceutical catalogues of abstracts and a yearbook of general essays a book ought to be produced that would prove not only of value to the pharmaceutical specialist, but also of interest to the intelligent practicing pharmacist. *E. K.*

Anleitung zur Qualitativen Analyse. Bearbeitet von Dr. Ernst Schmidt, o. Professor an der Universität Marburg. Vierte Auflage. Ein Bd., pp. 78. Tausch und Grosse, Halle a. S. 1896. M. 2.50.

The first edition of this guide appeared in 1884 as printed manuscript. Slight additions and changes have been made in the course of the subsequent three editions. The author has compiled in convenient form for laboratory guidance the information necessary to introduce students into the realm of chemical analysis.

The first part contains a description of the reactions of the more important bases and acids. The second part outlines the course to be pursued in the detection and identification of substances in mixtures, both according to the dry method, by way of preliminary test, and according to the wet method, which is treated more in detail. This part is supplied with a number of tables, which add materially to the facility with which the information thus arranged can be used. The supplement or third part contains similar information with reference to the rarer elements.

Nothing more need be said to introduce this new edition to the pharmaceutical public. The author is well and favorably known, not only in his native country, where pharmaceutical students flock to him from all parts of the Empire, but on this side of the Atlantic as well. *E. K.*

The Prelinnean Library of the Missouri Botanical Garden. Reprinted from the Seventh Annual Report of the Missouri Botanical Garden. St. Louis. 1896. pp. 86.

It is a subject for congratulation not only to botanists but also to students of pharmacy that, in an American library accessible to students, so complete and valuable a collection of earlier works on botany and related subjects as that here catalogued is to be found. This collection is the result of the endeavors of Dr. E. Lewis Sturtevant of South Framingham, Mass., who during a period of years accumulated this special library. It was presented by Dr. Sturtevant in 1892 to the Missouri Botanical Garden at St. Louis where it now occupies a separate alcove and has its separate card catalogue.

The titles of these books, 463 in number, form a pamphlet of eighty-six pages.

In glancing over the list of works contained in this library, many names well known to one interested in the historical aspect of pharmacy are met with. Among them the following may be mentioned: Albertus Magnus, the Bauhins, Caspar and Johann, Hieronymus Bock (Tragus), Boerhaave, Otto Brunfels, Camerarius, Fuchsius, Conrad Gesner, Garcias ab Horto, Lobelius Matthiolus, Monardes, John Ray, Rumphius, and Tabernaemontanus as well as the works of the founders of medicine, Theophrastus, Celsus, Hippocrates, Dioscorides and others.

In making known the resources of this collection, its custodians have conferred a not small favor on American students. *Rodney H. True.*

Allgemeine Waarenkunde. Handbuch für Kaufleute und Gewerbetreibende. Unter Mitwirkung von Fachgenossen, redigirt von Dr. Joseph Bersch. In 20 Lieferungen zu 30 Kr. = 50 Pfg. Lieferungen 1—4. A. Hartleben's Verlag in Wien. 1896.

A sufficient quota of the fascicles now lies before us to enable us to judge the character of the work. The four fascicles thus far published contain not less than 2450 articles and cross-references. Inasmuch as the book is intended for merchants it is made as intelligible as possible to the general reader without going deeply into scientific detail. It is to be a book of ready reference and information to dealers in drugs, chemicals, oils, produce etc. Inasmuch as articles of commerce from all parts of the world, even rare ones, are considered, the systems of weights, measures and coins of all commercial nations are given. The authors and publisher intend to make the work the most complete of its kind. The impression made by the book thus far is a good one. Particularly in this country where apprentices are so largely left without guidance and instruction the book will prove very valuable in wholesale and retail drugstores, to dealers of paints and oils, of dyestuffs and fabrics. A dictionary is not intended to give systematic information, but it is intended to inform the reader on one or any particular subject. A work of this kind may also have the additional advantage of leading to a desire for systematic knowledge. *E. K.*

Die Prüfung der chemischen Reagentien auf Reinheit. Von Dr. C. Krauch, Chemiker in der chemischen Fabrik von E. Merck in Darmstadt. Dritte, umgearbeitete und sehr vermehrte Auflage. Ein Bd., pp. 413. Verlag von Julius Springer, Berlin. 1896. M. 9.00.

The "good, old times" in which chemists prepared their own reagents have long been relegated to the past. The chemical manufacturer not only prepares the reagents and chemicals ordinarily used, but announces his willingness to prepare anything in his line whether it be for industry and the arts or for investigations still to be conducted and unpublished.

Yet with all this advance the analytical chemist as well as the chemical investigator are not infrequently hampered in their work by the lack of suitable reagents. The writer recalls an instance when a colleague had to prepare a quantity of hydrochloric acid free from arsenic, because none could be found in the three chemical laboratories of the university town in which he lived. Yet each laboratory had bottles of hydrochloric marked pure, strictly pure and chemically pure. Strange as it may seem the designation "chemically pure" is no longer regarded to stand for the greatest purity attainable. Stronger attributes are not infrequently used to express this.

Under such conditions it seems greatly desirable to emphasize the necessity of defining more accurately these commercial designations, and as far as possible, to give to them a scientific meaning which can be defined in chemical terms.

An attempt in this direction has been made by the author. That there is a real demand for a work of this kind is clearly evidenced by the fact that the third edition has now appeared within eight years after the first. The position of the author as chemist in a large manufacturing establishment has enabled him to take a genuinely practical point of view of this important matter. It is to be hoped that in the interest of pure chemical reagents the book may find a wide distribution and thus be of great usefulness. Persons who have at all examined their reagents, know the necessity of controlling their purchases even from supposed reliable houses, and will therefore be glad to avail themselves of a guide based not only on a theoretical knowledge of what reagents ought to be, but also on a practical knowledge of what they largely are. *E. K.*

Anleitung zur Mikrochemischen Analyse der wichtigsten organischen Verbindungen. Von H. Behrens, Professor an der Polytechnischen Schule in Delft. Verlag von Leopold Voss, Hamburg.

Erstes Heft: Anthracengruppe, Phenole, Chinone, Ketone, Aldehyde; mit 49 Figuren im Text. Brochure, pp. VIII, 64. 1895. M. 2.00.

Drittes Heft: Aromatische Amine; mit 77 Figuren im Text. Brochure, pp. VII, 135. 1896. M. 4.50.

This contribution to analytical chemistry is the result of the application of microchemical methods in the examination of organic compounds. The author has reviewed the works of Barfoed, Vortmann, A. H. Allen and others and has also studied the reactions published in chemical journals with reference to their applicability to microchemical methods. He calls attention to the fact that whereas the delicacy of these reactions does not begin to compare with those of inorganic chemistry, yet the microscopic reaction may prove a great economizer of both time and material. The author is further of the opinion that attempts to systematize these reactions would demand more time, to say the least, than the results would warrant. For this reason no particular classification is followed.

Primarily those substances have received attention which are of technical or forensic importance; secondarily those which frequently occur as decomposition products, inasmuch as they often result in the course of analysis as products of hydrolysis, oxydation etc.

For these reasons the author does not follow any particular system of chemical classification. Part two, in fact, which was reviewed on page 71 of this journal treated of vegetable and animal fibres. The contents of parts one and three are outlined above. Attention should be called to the fact that the alkaloids are grouped under aromatic amines. The typography is excellent and the book will no doubt prove a valuable contribution to organic analytical chemistry. *E. K.*

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EDITORIAL.

American Pharmaceutical Association.

> "From whatsoever state ye come,
> Welcome, thrice welcome, all."

For the second time in the history of the organization the American Pharmaceutical Association, true to its name, went to the north of our boundary line and met in Canada. The people of the United States are apt to consider their country as being synonymous with America, so the name American Pharmaceutical Association is as a rule thought of as being synonymous with United States Pharmaceutical Association. The meeting at Montreal fitly demonstrated that science and even professional interests in America know no more about national boundary lines than they know about lines more or less arbitrarily drawn between the various states and territories of the United States. It may truely be asserted that the members from the "States" hardly realized that they had gone into another country. The fact that Canadian-French was freely spoken in the streets of Montreal created no more surprise than to hear Low-German in the streets of Milwaukee, French in New Orleans or Spanish in the cities of the Mexican frontier. So little were the members from the United States aware that they had left their republic and had entered a country with a monarchial form of government that the refusal of United States silver by the street-car conductors or the motion of some member including "all the states", but omitting the provinces occasionally reminded them that Uncle Sam after all does not own the entire American continent. The stay at Montreal was most delightful in every respect, and in the due course of rotation the association will certainly be glad to receive another invitation from one of Her Majesty's provinces to the north of our boundary. Our pharmaceutical brethren of the Province of Quebec have demonstrated that we are not only one in science and professional aspirations, but that whatever language we may speak or whatever our religious beliefs may be, whether living in a republic or a royal colony, at heart we are really one people. Such an object-lesson is truly elevating at a time when Europe with her standing armies is constantly in dread of war and within half a year after our own political papers were full of war-talk with our nearest relatives beyond the sea.

In a similar manner the meetings of the association are a means for education wherever they are held. Different views held by men in widely separated sections of our own country are brought up for discussion. The American is fortunately so constituted that he does not regard as a personal enemy every one who begs to differ from him in scientific, educational or other matters. Personal contact with persons of different views is of greater importance to the members of our association than the mere listening to papers that are read, no matter how valuable they may be.

Possibly a dozen pharmaceutical journals were represented at Montreal, and almost as many will "report" the meeting. It seems highly probable that little more will be done, certainly not by most of them.

The value that comes from reading a paper before a scientific body lies largely in the discussion that follows. The association is not only to benefit by the presentation of new facts, or of new conclusions drawn from known facts, but the writer himself is to receive the benefit of friendly criticism. The fact that criticism has largely degraded to flattery or flagrant abuse is no reason why reasonable criticism should be discarded. If this is true of papers presented before scientific organizations, it is even more largely true of the meetings of such societies themselves. Rather than to "report" the Montreal meeting the Review hopes that the discussion of the character of the sessions may not prove altogether valueless, particularly if the criticism is offered in a truly friendly though earnest spirit.

It has recently been said that what "literary production needs in this country now, more than in any other, is criticism — cool, discriminating, relentless criticism", and that it cannot be construed even as flattery to judge it by a provincial standard. It would be mean praise indeed to state that the American Pharmaceutical Association compares favorably with state pharmaceutical organizations; that the absence of "Kirmis"-attractions from its meetings speaks well for the high standard of pharmacy as represented by our national, or more correctly speaking, by our international organization. Our standard must be the highest standard attained by similar organizations, not only of America, but of the civilized world. If we fall short of this standard we should not court vulgar popularity by saying "the American Pharmaceutical Association is good enough for me", but should earnestly endeavor to improve any shortcomings.

Neither should the falling short from the highest attainable standard discourage us, or cause us to shrug our shoulders at the mere mention of the A. Ph. A. and stay away from its meetings. If we do not take sufficient pride in American pharmacy to put our shoulder to the wheel, when the application of even a little energy will cause it to move in the right direction, we are no more true patriots than he who thinks patriotism consists not only in praising everything that may be construed American, but in finding faultless everything said and done by those who, on account of mere legal citizenship, claim to be Americans.

The American Pharmaceutical Association, on the whole, has a record of which it certainly need not be ashamed. It, no doubt, has been a most valuable institution bent on the progress of American pharmacy. Unfortunately, however, with the popular American idea of greatness some members have confounded numbers with character, quantity with quality. In the opinion of some the ideal American Pharmaceutical Association should include every druggist of this land; and, we have reason to fear, that if the movement had become more popular and the druggists of America had been more willing to join, the line would not even have been drawn at the twenty-five percent of Massachusetts rum-druggists, who fortunately no longer disgrace our calling in that state.

The same is true of papers presented at the meetings of various sections. We have had chairmen who boasted of having secured the largest number of papers for their section, even if these consisted merely of answers to queries, some of which were written twelve or twenty-four hours before the meeting at which unfortunately they were read.

If the individuals went begging the association went begging also, for these individuals as officers were the duly elected or appointed representatives of the association. The result of such tactics during the past years has been that even positions in the gift of the association or its sections seem to have gone begging also. Older members, who most keenly feel the stigma of reproach, and who are as just as they are broad and liberal in their views, and equally longsuffering, have not only come to the conclusion that in reality the association has itself to blame very largely, but that by all means an end must be put to anything and everything that tends to depreciate the character and dignity of an international organization composed of scientific and professional men. The thing to do for each and everyone is to give his earnest support to every detail of association activity and to exclude that which is unbecoming and improper by simply doing that which is right and insisting that only that be done.

The **General Sessions** of the association were not characterized by any extraordinary act. President Good, in his address, called attention to the fact, that while the bill requesting the use of the metric system in all governmental transactions did not become a law, yet we came nearer being successful than ever before. The negative result should, therefore, not discourage us; but rather encourage to renewed activity under more favorable circumstances, while the work of education should go on uninterruptedly.

Another matter of importance, to which attention was called in the president's address, was the introduction into the U. S. Pharmacopœia of patented chemicals used as medicinal agents as suggested a few months ago by Dr. Chas. Rice, chairman of the U. S. P. Revision Committee. There are still several years before the meeting of the next Pharmacopœial Congress, thus leaving sufficient time for a thorough discussion of the entire matter. The patenting of a process for the manufacture of any chemical is not only legitimate, but perfectly ethical, whether the product may or may not be used medicinally. The injustice lies not in the patent *per se*, but in the monstrosity known as the United States patent law, which enables the patenting not only of process, but of product as well. Many American druggists hate the European manufacturer and everything pertaining to him because in our "free" country our laws give away rights and privileges, which the foreigner could not buy in his own country. The open highway robbery is possible only because it is sanctioned by our own government. If our vicious patent laws could first be righted American pharmacists would look at the subject of the introduction of patented chemicals into the pharmacopœia with entirely different eyes.

The principal work of the association was, as usual, accomplished in the various sections. The absence of matters of immediate vital importance in the general sessions made this all the more apparent. This being the case, it is unfortunate that the sections should in any way or manner be hampered in their important work. The work of the council, of the general sessions and of the sessions of sections should not be permitted to interfere with each other as was not infrequently the case. No doubt, it is difficult to fix responsibility; but members, who talk unnecessarily, as well as officers who are late in calling meetings to order, should remember that one part of the association cannot carry out its programme to greatest advantage, if another part is permitted to dispose of time already allotted.

Of the two meetings allotted to the **Commercial Section** only one was held. When the audience of this section is in no small part made up of representatives of the press and of college professors, the time for reflection as to the vitality of this section certainly must be considered ripe. As one of the oldest members of the association remarked, the American Pharmaceutical Association was organized by the retail druggists of this country for the retail druggist. We may or may not be of the opinion that it was a good thing for the association to have outgrown this rather narrow sphere of activity, yet the same gentleman also went on record with the statement that he "had no use for the Commercial Section" and that he would "like to see it abandoned." When it was suggested that time might be gained by having the meetings of the Commercial and Scientific Sections at the same time, attention was called to the fact that this would not do because the Commercial Section "needed careful watching."

Such remarks certainly do not redound to the credit of this section. The fact is that the druggists of this country are becoming distrustful of the efficacy of commercial remedies for their ills. To a list of queries sent out by the chairman of this section he received only a very limited number of answers, and of these the serio-comical ones constituted the most appreciated portion of his address. Besides this address only a single paper was read before this section. Committees also, apparently at least, did not have much if anything to report. Yet the meeting, spiced by witticisms and retorts, disposed of an afternoon and the section perpetuated itself by the election of officers and the appointment of new committees. The evening session, fortunately in this case, was renounced, giving members of the association an opportunity to witness the brilliant *fête nuit* at Boucherville some ten miles down the St. Lawrence.

Although the number of papers presented to the **Scientific Section** was by no means frightfully large, yet the three sessions of this section were without doubt the best of the Montreal meeting. Curtailed somewhat as to time, business had to be crowded during the last session. Nevertheless, everything went off smoothly. In fact, the expeditious and pleasant manner with which the business of this section was conducted by the chairman was truly a matter of congratulation.

In his brief address the chairman emphasized the fact that it was not only a privilege and a duty of the pharmacist to be a scientist, but that it was his birthright. If he chooses to relinquish this birthright he will have only himself to blame for the consequences.

The committee on indicators for the titration of alkaloids made an extensive report, and as the same committee was reappointed and has enlisted in its service a number of volunteers, valuable results may be looked for in the field of alkaloidal assay of drugs.

The committee on special research made a report on what little it had been able to accomplish. Yet the committee was deemed of sufficient importance to be reorganized on a better basis and a large volume of work was referred to it.

If a section has not only the power to attract to itself the younger scientific element that has entered the ranks of our profession in comparatively recent years, but draws back to its meetings veterans in scientific pharmacy like Prof. Prescott it certainly seems to have a new lease for life. For a number of years many of the older and better scientists seemed to hold themselves aloof from the meetings of the association and the Scientific Section, like other sections, went begging for papers.

As already indicated, the number of papers presented was not very large, yet there were a fair number of scientifically valuable papers. It is of interest to note that the two papers embodying possibly the largest number of positive results were made possible by privately endowed fellowships in connection with two "smaller" state universities of the Northwest, who, according to a rabid paper presented in another section, are trying to attract students by lowering the standard of pharmacy.

Another paper of considerable interest was a preliminary report by the chairman on the destructive distillation of linseed oil resulting in the formation of paraffin hydrocarbons from the mixture of which illuminating oils and slack paraffin had been separated. These results are not only of practical interest, but even more so theoretically, because they help to explode one-sided views with regard to the formation of natural petroleum.

A number of other papers that were of special interest and called for questions or evoked discussions were read. Two of direct practical value were those of Mr. Alpers on Gelatine capsules with demonstrations as to the use of a newly devised capsule filling machine by the author; and of Prof. Caspari on Alcohol as a source of error in the titration of alkaloids and alkaloidal residues.

Of the three sessions scheduled for the **Section on Education and Legislation** only two were held. Unfortunately it cannot be said that the business of this section was conducted in a satisfactory manner. Whatever may be said about individual or collective responsibility as to the character of a section, it is to be hoped that the demonstrations of this year may serve as a lesson, making a repetition of such scenes as were witnessed on Saturday afternoon and evening an impossibility.

The redeeming feature of these two sessions consisted in the reports and papers of the secretary. Prof. Beal deserves the thanks of the section for the large amount of work done by him, and it is to be hoped that he will be made chairman of the committee which is requested to prepare a preliminary draft for a model pharmacy law to be submitted to this section next year. That good humor finds a place in and is duely appreciated by this section was demonstrated by a paper of the secretary in which he threw some side-lights on present pharmacy laws.

The ghost of "practical experience before graduation" was revived by but one paper, which was of such rabid character that it evoked but a solitary remark and that a denunciatory one. Nothing can do more to bury the dead than such papers inspired by ignorance. The advocates, who relegate so-called "practical experience" to the drug stores and state-boards, and who claim that universities and colleges are educational institutions and that only, can well afford to remain quiet when such onslaughts are made.

The **Social Programme** arranged by the local committee was of the highest order and more than one feature will be long remembered by those who were participants. Among the numbers of the programme the extemporized trip to Boucherville to witness the brilliant festival of the rowing club and the shooting of the Lachine Rapids were no doubt the most interesting. The car-ride on Friday afternoon through the city and its suburbs, trips of individuals and of smaller parties to Mount Royal, to the Market on Friday morning, and visits to the magnificent churches etc. made pleasant breaks into the official programme of the association. Members of the association will not only take home as souvenirs the pretty badge emblematic of our northern neighbor, but will carry with them more durable mental souvenirs that will outlast wear and tear in the every-day toil of commercial and professional activity. While we look back with pleasure to our gathering at Montreal, let us look forward with the anticipation of an equally pleasant and profitable meeting at Lake Minnetonka in '97. *E. K.*

ORIGINAL CONTRIBUTIONS.

Estimation of Hydrocyanic Acid in Bitter Almond Oil.

By *Edward Kremers* and *O. L. Schreiner.*

(Report of *Research Committee G*, U. S. P. Revision.)

The estimation of hydrocyanic acid in bitter almond oil is of great importance since the value of this oil as a medicinal agent depends possibly entirely upon the quantity of hydrocyanic acid present. The estimation may be accomplished either by volumetric or gravimetric methods. The best gravimetric method consists in adding to an aqueous solution of the oil some silver nitrate solution and then ammonia in excess, immediately acidifying again with nitric acid. The precipitate of silver cyanide so produced contains all of the hydrocyanic acid that was present, whereas the amount of silver cyanide obtained without this treatment with ammonia represents only a part of the hydrocyanic acid. This is due to the fact that the hydrocyanic acid exists for the most part in the form of benzal-cyanhydrin, $C_6H_5.CH(OH).CN$, and is therefore not capable of uniting with the silver to form cyanide until the compound is broken up by ammonia. The volumetric method generally used in the estimation of bitter almond water is the well known one of Liebig, but the results obtained are always a little higher than those obtained by the gravimetric method. This is due to the fact that bitter almond water contains but a relatively small amount of hydrocyanic acid in a large volume of water and hence the first formation of a precipitate is not readily recognized unless the solution be perfectly clear. For this reason Rieckher[1] and also Souchay[2] prefer the gravimetric method, because this can be used with any bitter almond water; whereas Liebig's method is applicable only to perfectly clear samples, which can, however, be but seldom obtained.

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[1] Neues Jahrb. d. Phar., 18, p. 1.
[2] Ztsch. f. Anal. Chem., 2, p. 173.

Vielhaber[3] estimated the amount of hydrocyanic acid in bitter almond water by adding to a weighed or measured quantity of the water magnesium hydrate suspended in water, and then titrating this opaque mixture with $\frac{N}{10}$ silver nitrate solution, using potassium chromate as indicator. The results agree very well with those obtained by the gravimetric method and the end reaction is as readily determined as is that in the analogous chlorine estimation.

It was thought that Vielhabers's method might be applicable to the direct volumetric estimation of the hydrocyanic acid in the oil. While the gravimetric estimation is very satisfactory, yet it is a decided advantage to have a volumetric method by which the oil can be more quickly estimated by the pharmacist. Experiments made with a sample of genuine bitter almond oil have shown the method to be applicable and satisfactory. It was found to be unnecessary to add the oil to a quantity of water sufficiently large to effect solution, but that a very small amount of water will do, thus increasing the accuracy of determining the end reaction. Determinations made with a large volume of water and the magnesia mixture always gave higher results, because several drops of the silver solution had to be added in excess before the red tint could be unmistakably recognized. By working in a small volume of liquid the end reaction could be determined with much greater accuracy. The details of the method are as follows:

1 gram of the oil is weighed off very accurately in a small Erlenmeyer flask. To it 10 c.c. of a mixture of magnesium hydrate with water and a few drops of potassium chromate solution are added. The titration with $\frac{N}{10}$ silver nitrate solution is then effected very slowly until the red chromate of silver formed indicates the end of the reaction, the mixture being continually agitated so as to bring the oil into intimate contact with the solution. From the amount of silver solution required the hydrocyanic acid may be readily calculated. Every c.c. of $\frac{N}{10}$ silver nitrate solution corresponds to 0.0027 gram hydrocyanic acid.

Commercial samples of bitter almond oil were obtained but not one of them contained even a trace of hydrocyanic acid. These oils had been obtained through wholesale houses of good standing as pure oils at prices varying from $4.50 to $6.00 per pound. That the oils were not those specified as "free from hydrocyanic acid" is shown by the presence of chlorinated compounds, which brand them as artificial oils or commercial benzaldehyde. The artificial benzaldehyde of commerce, which is prepared from benzal chloride, $C_6H_5.CHCl_2$, as a rule is more or less impure from the presence of chlorinated compounds, which give to the oil a pungent, repulsive odor and highly unpleasant taste, and thus alter the oil in such a manner as to make it entirely unfit for the preparation of perfumery or liquors. In estimating the purity of such oils it is therefore only necessary to restrict oneself to the detection of organic chlorine compounds. This is readily accomplished by the so-called "combustion method" given in the U. S. P.

The chlorine may be present as mono- or di-substitution products of benzaldehyde and benzyl alcohol or as benzyl chloride etc. The presence of these chlorinated products may be detected by the following method given in Schimmel & Co.'s Bericht, April 1891.

A small quantity of the oil to be examined is oxidized with a warm alkaline solution of potassium permanganate, any excess of the latter being decomposed by the addition of a few drops of alcohol. The mixture is filtered and the filtrate acidified with pure, dilute sulphuric acid. Upon cooling, the separated benzoic acid — which contains the chlorine substitution products of the benzene ring in the form of chlorinated benzoic acid — is thrown on a filter and carefully washed. The benzoic acid is dissolved in pure potash solution, a little nitre added, the solution evaporated to dryness and finally heated in a platinum dish. The incinerated residue is dissolved in water, the solution acidified with nitric acid, filtered and tested for chlorine by silver nitrate.

Alkyl chlorides may be detected as follows:

5 to 10 grams of the oil are heated to boiling in a distilling flask and the first 10 to 12 drops of the distillate are caught in 5 percent alcoholic potash. The alcoholic liquid is heated for a time in a flask connected with a reflux condenser. The alcohol is then volatilized, the residue treated with water, and the oily constituents (benzyl alcohol, etc.) removed by shaking out with ether. The aqueous liquid is warmed for a short time in a dish, acidified with nitric acid, filtered when perfectly cool from the separated benzoic acid and the filtrate tested for chlorine.

These methods can, with slight modifications, be used for the quantitative estimation of the respective chlorine compounds; but this is seldom if ever necessary.

All the samples of bitter almond oil examined, with the exception of the cabinet specimen of genuine oil, contained large quantities of benzoic acid, which crystallized out when the oils were subjected to a temperature lower than that of the room, showing the oil to be nearly saturated with benzoic acid. This tendency of bitter almond oil to become oxidized is highly objectionable to the consumer, inasmuch as such changed oils are of minor value to the perfumer or cordial maker. This change shows itself by the formation of small crystals in the upper part of partly filled bottles which, becoming larger, sink to the bottom until finally the oil is changed to a crystalline mass of benzoic acid. This was the condition in which the so-called bitter almond oil was found in several stores where inquiry was made. The oxidation is much more rapid in the case of the artificial oils. These consist, aside from the chlorinated impurities, simply of benzaldehyde and are therefore very prone to oxidation, whereas in the natural oil the aldehyde group is largely replaced by the cyanhydrin group, which is not so susceptible to atmospheric oxygen. The oxidation may be avoided by keeping the oil in bottles filled to the neck and carefully closed; but this cannot always be carried out in practice. Schimmel & Co.[4] found that the addition of 10 p. c. of alcohol to the oil decreased its susceptibility to oxidation to a marked extent, whereas the addition of only 5 p. c. of alcohol increased the formation of benzoic acid.

Three bottles containing artificial bitter almond oil: alone and with 5 and 10 p. c. alcohol respectively, were allowed to stand under the same conditions for several weeks. A quantitative determination of the free benzoic acid formed gave the following result: for the pure benzaldehyde 12.8 p. c.; for the benzaldehyde with 5 p. c. alcohol 31.4 p. c.; but for the one containing 10 p. c. of alcohol only 1.3 p. c. It would therefore seem advisable to add 10 p. c. of alcohol to artificial bitter almond oil or natural oil "free from hydrocyanic acid". Of this mixture 11 parts must be dispensed for every 10 parts of pure oil.

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[3] Arch. d. Phar., [3], 13, p. 408.

[4] Schimmel & Co., Ber., April, 1895. Ztsch. f. Anal Chem., 3, p. 34.

In the artificial oils the amount of benzoic acid can be determined by direct titration with alkali, using phenolphthalein as indicator. The results of the examination of commercial samples of bitter almond oil are enumerated in the following table.

Samples.	Specific gravity at 20°.	Hydrocyanic acid.	U. S. P. test for chlorinated compound.	Benzoic acid in solution.	Remarks.
1.	1.067	4.45% 4.42%	Free from chlorinated compounds.	No determination.	Genuine oil.
2.	1.074	0 p. c.	Chlorine present.	17.16 p. c.	Commercial benzaldehyde. A large quantity of benzoic acid separated on cooling.
3.	1.059	0 p. c.	Chlorine present.	17.04 p. c.	Commercial benzaldehyde. About one third of the oil had solidified. The supernatant oil separated a large quantity of benzoic acid on cooling.
4.	1.057	0 p. c.	Chlorine present.	9.74 p. c.	Commercial benzaldehyde. No benzoic acid separated on cooling.
5.	1.070	0 p. c.	Chlorine present.	20.89 p. c.	Commercial benzaldehyde. This oil congealed to a solid mass of benzoic acid when cooled below 20° C. The congealing point rose in a short time to 25° C. This possibly was due to the further oxidation of the oil while in contact with the air.
6.	1.070 at 30°.	0 p. c.	Chlorine present.	20.69 p. c.	Commercial benzaldehyde. The bottle contained considerable benzoic acid in solid form. That in solution separated at temperatures below 25°.

On the Chemical Composition of the Oil of Monarda Fistulosa (L).

By *E. J. Melzner* and *Edward Kremers.**

Introduction.

A year ago a specimen of oil of Wild Bergamot was examined in this laboratory. It was found to contain about fifty percent of carvacrol. From the non-phenol constituents there were obtained cymene and an oxygenated fraction of a very high boiling point. Furthermore there was isolated a crystalline coloring matter, resembling alizerin. These investigations were reported in the Pharmaceutische Rundschau, Vol. 13, p. 207; also in the last volume of the Proceedings of the A. Ph. A. The commercial importance of the discovery of so large a quantity of carvacrol in so common a plant, is alluded to in one of the closing paragraphs. A question of physiological interest is also alluded to in the following words: "If the oils examined by previous investigators had been positively derived from *Monarda punctata*, one might be inclined to suppose that the two species *punctata* and *fistulosa*† produced two isomeric yet chemically distinct phenols, viz: thymol and carvacrol. Under the conditions such a conclusion would be unwarranted at present—this all the more so, if one recalls the observations made in the laboratories of Schimmel & Co., that e. g. oil of thyme sometimes contains thymol, sometimes carvacrol, or both. This question of plant physiological interest can therefore be answered only after a longer and more careful study of the oils of both species of *Monarda*. Material for this purpose is already being collected."

The material to which reference is made in the above paragraph was collected weekly, as far as possible, and was obtained largely from the same field from which the previous material had been collected. There existed, however, a marked difference in the plants. The summer of 1895 having been exceedingly dry, the plants were rather small and, on the whole, did not possess a healthy appearance. A noticeable difference in the oils also existed. Whereas the oil distilled in 1894 was dark red in color, that distilled in 1895 from the same field was on the whole of a light yellowish color. Even, in some instances, in which the oil was slightly reddish in color when freshly distilled, this color disappeared upon standing. Further details with regard to conditions of the herb and of the peculiarities of the oil obtained therefrom will be given in a subsequent table.

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* Report to Committee on Special Research of the Am. Pharm. Ass., presented at the Montreal Meeting.

† The plants from the two sources were identified by Mr. L. S. Cheney, instructor in pharmaceutical botany at the University of Wisconsin.

It is of interest to note that a quantity of oil distilled from the herb growing under more favorable conditions and collected at a point only five miles distant from the former field, was dark red with a permanent dark red color.

It is still too early to state definitely from what part of the herb this coloring matter is obtained. It was thought at first to reside in the purplish stems. It was learned, however, that the presence or absence of those stems had no effect on the color of the oil. It may be worth mentioning in this connection that the yellowish oil was obtained from plants devoid of flowers, also with such in full blossom, but poorly developed seeds. On the other hand, dark red oil was obtained from plants in full blossom, in which the seed, that had already formed, seemed normally developed. It is too early, however, to attribute the coloring to the normally developed seeds. Possibly there is no relation between the two; the poorly developed seeds and the absence of volatile coloring matter being both due to the excessive drought. This subject, like other subjects pertaining to this oil, will be further investigated.

Experimental Part.

Inasmuch as the various specimens of the oils have been obtained at different intervals during the summer and early fall, it was of considerable interest to ascertain if the phenol constituent of these oils varied to any extent. Phenol determinations were therefore made of each separate specimen.

The following table contains an enumeration of the oils obtained from plants collected near Chandler Street at different times during the months June, July, August and September; also statements with reference to the parts of plants used, specific gravity and rotatory power of oil as well as the results of a crude phenol estimation.

No.	Date of Collection.	Description of Oil.	Part of Plants used.	Sp. gr., determined shortly after dist.	Sp. gr. redetermined in Jan. '96.	Rotatory power.	Percentage of Phenol.
1.	June 21, '95.	Light yellow.	From leaves only.	0.931 July 25.	0.931 at 24° C.	–3°16½′ in 220 mm. tube.	65.2 p. c.
2.	June 26, '95.	Light yellow.	From leaves only.	0.931 July 25.	0.931 at 25.5° C.	–1°19′ in 100 mm. tube.	67.6 p. c.
3.	July 2, '95.	Yellow (turbid).	Leaves and stems.	0.932 July 25.	0.939 at 20° C.	–2°45′ in 220 mm. tube.	72.0 p. c.
4.	July 9, '95.	Light yellow.	Leaves, stems and buds.	0.936 July 25.	0.939 at 23° C.	–2°12.7′ in 220 mm. tube.	69.6 p. c.
5.	July 16, '95.	Light yellow.	Leaves, stems, and some flowers.	0.932 July 25.	0.937 at 21° C.	–1°44¼′ in 220 mm. tube.	66.8 p. c.
6.	July 23, '95.	Light yellow.	Leaves, stems, flowers and buds.	0.932 July 26.	0.935 at 20° C.	–0°46′ in 100 mm. tube.	67.5 p. c.
7.	July 30, '95.	Greenish-yellow.	Leaves, stems and flowers.	0.935 Aug. 2.	0.941 at 15° C.	–1°45′ in 220 mm. tube.	72.0 p. c.
8.	Aug. 6, '95.	Light yellow.	Stems, leaves, flowers and seed.	0.923 Aug. 8.	0.9261 at 20° C.	–1°1.7′ in 100 mm. tube.	65.5 p. c.
9.	Aug. 13, '95.	Light amber.	Stems, leaves flowers and seed.	0.921 Aug. 15.	0.930 at 20° C.	–2°8′ in 200 mm. tube.	70.0 p. c.
10.	Aug. 20, '95.	Greenish-yellow.	Stems, leaves and buds.	0.927 Aug. 22.	0.932 at 21° C.	–2°3′ in 220 mm. tube.	64.4 p. c.
11.	Sept. 3, '95.	Greenish-yellow.	Stems and leaves.	0.916 Sept. 5.	0.925 at 20.5° C.	–2°12½′ in 220 mm. tube.	58.0 p. c.
12.*	Aug. 9, '95.	Light amber.			0.9311 at 20° C.	–1°2.9′ in 100 mm. tube.	63.0 p. c.

Estimation of Carvacrol.

The results of the carvacrol determinations recorded in Table I. were obtained by shaking 25 cm. of the oil with 75 cm. of a 10 p. c. solution of sodium hydroxide. The amount of oil not dissolved by the soda solution was read off and the difference was calculated as carvacrol.

It is known, however, that strong solutions of caustic alkali particularly not only dissolve phenols but other substances: hydrocarbons, alcohols, etc., as well. Oil No. 9, which when shaken but once with a 10 p. c. soda solution, showed a percentage of 70 p. c. of carvacrol; when shaken four times with a 5 p. c. solution of soda solution showed a percentage of only 54.8 p. c. carvacrol. Duplicate tests were made. The following table indicates the results of the repeated action of the soda solution in the oil in duplicate tests.

	I.	II.
First Reading	26%	30.8%
Second Reading	51.2%	52.4%
Third Reading	54.4%	55.2%
Fourth Reading	54.4%	55.2%

It thus becomes apparent that the amounts in the first have only a relative value.

Phenol determinations of the dark oil obtained from plants collected at Picnic Point were also made. In one estimation the oil, however, was diluted with an equal volume of petroleum ether. With a 10 p. c. soda solution the undiluted oil showed 65.3 p. c. and 65.6 p. c. respectively. Diluted with petroleum ether the oil showed with 10 p. c. soda solution 60.4 p. c. and 60.8 p. c. respectively. 100 cm. of undiluted oil shaken first with 300 cm., then with 100 cm., and lastly with 50 cm. of 5 p. c. soda solution gave respectively in duplicate tests the following results:

	I.	II.
First Reading	42%	42.5%
Second Reading	52.5%	53.5%
Third Reading	56.5%	57.5%

Titrimetric Estimation of Carvacrol.

5 gm. of the oil, diluted with 10 cm. of petroleum ether, were repeatedly shaken with 5 p. c.

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* Collected near Lake Wingra.

sodium hydroxide solution, until no more of the oil was dissolved. The oil was then tested for carvacrol by Flückiger's reaction, which consists in heating a few drops with chloroform and a little solid sodium hydroxyde, when, if carvacrol is present, a wine red color will appear. The absence of color will show that all of the carvacrol has been removed by the soda solution. The alkaline solution of carvacrol was made up with the 5 p. c. soda solution to 100 cm. or 200 cm. as the case required. To 10 cm. of this solution a sufficient quantity of $\frac{N}{10}$ iodine volumetric solution was added to convert all of the carvacrol into carvacrol iodide. To effect this a slight excess of iodine was necessary. In order to know when a sufficient quantity of iodine had been added, a few drops were removed from time to time and added to some diluted hydrochloric acid. In this way, free iodine can be detected as soon as it is in excess.

The mixture was then made up to 500 cm. and filtered. The carvacrol iodide did not separate readily, but separation could be induced by agitation of the milky liquid. To 100 cm. of the filtrate diluted hydrochloric acid was added and the liberated iodine estimated with $\frac{N}{10}$ sodium thiosulphate volumetric solution. The quantity of $\frac{N}{10}$ sodium thiosulphate required, multiplied by 5, gives the quantity of $\frac{N}{10}$ iodine solution that had been added in excess. From this the amount of iodine required can be easily found.

Every molecule of carvacrol requires four atoms of iodine, therefore every cm. of $\frac{N}{10}$ iodine volumetric solution is equivalent to 0.0037415 cm. of carvacrol.

Only a few of the specimens of oil were tested according to this method.

No. of Oil.	By titration.	By volume.*	Percentage by volume in 100 cc. cylinder.†
1.	1st. 52.00 p. c. 2nd. 52.3 "	64%	65.2%
2.	1st. 54.7 p. c. 2nd. 54.00 "	66%	67.6%
7.	1st. 58.48 p. c. 2nd. 58.00 "	70%	72%
	1st. 58.20 p. c. 2nd. 58.40 "	71%	
10.	1st. 53.34 p. c. 2nd. 53.36 "	64.5%	64.4%
	1st. 54.46 p. c. 2nd. 54.26 "	65.5%	

Isolation of Carvacrol.

The aqueous alkaline solution containing the sodium carvacrolate was distilled with water vapor to remove any dissolved non-phenol portions of the oil. The solution was then acidulated with 50% sulphuric acid and again distilled and identified as carvacrol iodide into which all of it was converted. In the flask there remained a dark-brown tarry residue. An attempt to sublime this between watch-glasses proved a failure.

Non-Phenols.

The combined portions of non-phenols from the various oils were distilled with water vapor. The first portion came over very clear, and then a much darker portion. These were kept separate. The light portion had a specific gravity of 0.847 at 21° C. and rotatory power of 24′ in 220 mm. tube. The dark portion had a specific gravity of 0.874 at 21° C. and rotatory power of —7° 50′ in 220 mm. tube.

In order to ascertain the presence or absence of esters in this portion of the oil, the following ester determinations were made. 10 cm. of the light portion were boiled for one hour with 50 cm. of a 50% alcoholic potassium hydroxide solution. Upon titration of the alkali it was found that no saponification had taken place. The same experiment was tried with the dark portion with like results.

The light and heavier oils were then fractionated separately, the results of the fractionations being recorded in the following table:

Fraction.	Light Oil.	Heavy Oil.	Total.
—170°	75.0 cm³.	18.0 cm.	93.0 cm.
170°—180°	55.5 cm³.	47.0 cm.	102.5 cm.
180°—190°	5.5 cm³.	10.0 cm.	15.5 cm.
190°—200°	2.0 cm³.	11.5 cm.	13.5 cm.
200°—220°		11.0 cm.	11.0 cm.

The corresponding fractions were then mixed and refractionated. The results of the second fractionation, together with quantity, specific gravity, and rotatory power of the fractions are recorded in the last table.

Table II.

Fraction.	Quantity.	Sp. gr. @ 20° C.	α *	$[\alpha]_D$
160°—165°	6.0 ccm.	0.8474		
165°—169°	8.8 ccm.	0.8438	—2°—1′	—2.37
169°—170°	8.5 ccm.	0.8460	—1°—30′	—1.77
170°—171°	11.0 ccm.	0.8427	—1°—2′	—1.22
171°—172°	9.0 ccm.	0.8628	—1°—0′	—1.15
172°—173°	16.0 ccm.	0.8488	—0°—10′	—0.19
173°—174°	20.0 ccm.	0.8682	—0°—8′	—0.15
174°—175°	25.5 ccm.	0.8440† 0.8652 at 4°	+0°—36′†	+0.71
175°—176°	18.5 ccm.	0.8480† 0.8663 at 4°	+1°—2′†	+1.22
176°—177°	14.5 ccm.	0.8502	+1°—34′	+1.84
177°—178°	11.0 ccm.	0.8547	+1°—25′	+1.67
178°—179°	10.5 ccm.	0.8528	+1°—35′	+1.88
179°—180°	9.0 ccm.	0.8573	+1°—44′	+2.02
180°—182°	8.0 ccm.	0.8649	+1°—35′	+1.83
182°—184°	9.0 ccm.	0.8650	+1°—58′	+2.23
184°—188°	7.8 ccm.	0.8686	+1°—45′	+2.01
188°—193°	.5 ccm.			
193°—198°	.5 ccm.			
198°—200°	2.5 ccm.			
200°—210°	3.5 ccm.			
210°—220°	3.0 ccm.			
220°—230°	1.0 ccm.			
230°—235°	2.0 ccm.			
235°—240°	11.5 ccm.	0.9430		
Residue	3.0 ccm.			

This table emphasizes what was demonstrated a year ago. More oil is being distilled this year, so that larger fractions of the non-phenol constituents may be obtained for a more detailed chemical examination.

Pharm. Chem. Laboratory,
University of Wisconsin.

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* Burette reading. For further details see: The volumetric estimations of phenols by Edward Kremers and O. Schreiner, results soon to be published.

† Taken for comparison from the first table.

* In a 100 mm. tube at 20° C.

† At 24° C.

Salol in Salicylic Acid.*

By Dr. *Fred. Hoffmann.*

Among the queries proposed by the Committee on Scientific Papers for the present annual meeting of the American Pharmaceutical Association is one in regard to the occasional presence of salol in commercial synthetic salicylic acid. In order to account for this fact it is not necessary to enter upon any consideration of the various methods of the preparation or the properties and reactions of salicylic acid, but simply to call to mind the fact that this acid when exposed to heat suffers at about 160 to 240° C., a decomposition, partly into phenol and carbonic acid, and partly into anhydrides which by a partial re-combination with the phenol form salol. One of the various patented methods of the manufacture of salol is based upon this process.

The direct transformation of salicylic acid into salol by heat may be indicated by the following equation:

$$\underbrace{2C_6H_4\begin{cases}COOH\\OH\end{cases}}_{\text{Salicylic acid.}} = \underbrace{C_6H_4\begin{cases}COOC_6N_5\\OH\end{cases}}_{\text{Salol.}} + \underbrace{H_2O}_{\text{Water.}} + \underbrace{CO_2}_{\text{Carbonic acid.}}$$

As is well known, or may readily be ascertained from any work on pharmaceutical chemistry, the various older methods of manufacture of synthetic salicylic acid involve for the final isolation and purification of the acid processes of precipitation and subsequent re-crystallization from solutions of the acid whereby impurities and by-products, including traces of phenol and salol, are entirely removed. While the original patentees and manufacturers of synthetic salicylic acid continue in their approved methods of purification, some other manufacturers more recently seem to employ processes of distillation or of sublimation for the purification of their product. In this case the above equation accounts for the fact that such brands of salicylic acid may contain traces of salol. But as salol has a slight but distinct aromatic odor while pure salicylic acid is entirely odorless, no manufacturer will bring a product into the drug-market which contains so much salol as to *prima facie* indicate such contamination by the odor of salol. If such occasionally is met with in salicylic acid it can only be due to insignificant traces, which from a therapeutic point of view are of no consequence since both substances have a similar action and use.

In order to ascertain the presence of salol in salicylic acid a sample is dissolved in a dilute aqueous solution of sodium or ammonium carbonate without applying heat. Pure salicylic acid renders a clear solution while salol, being insoluble, gives a turbid one. Being readily soluble in ether, the salol is extracted from the turbid salicylic acid solution by shaking with a little ether. The ethereal solution is then separated and shaken with about half its volume of distilled water in order to remove traces of salicylic acid. The ethereal solution is separated and evaporated on a watch-glass at a gentle heat. The residue is dissolved in a few drops of alcohol and left standing for crystallization. The dry residue or the crystals of salol are identified by its characteristic low melting point at 42 to 43° C., while salicylic acid melts at about 157° C.

In view of the absurd statements occasionally met with in American trade-papers, that "salicylic acid made from phenol, unless carefully purified, contains highly toxic by-products, while that made from oil of wintergreen is pure" and similar ones, well-informed practitioners of medicine and pharmacy need not be reminded of the fact that any objectionably impure salicylic acid, unless artfully adulterated, is excluded from the drug-market not only by the pharmacopœial requirements, but as far as a contamination with salol is concerned, by the very nature and characteristic odor of this phenyl salicylate. Moreover, as stated before, the presence of salol can only amount to traces insignificant in the medicinal, industrial and household application of salicylic acid.

TRANSLATIONS.

Reagents and Reactions known by the Names of their Authors.*

Based on the original collection by *A. Schneider,* revised and enlarged by Dr. *Julius Altschul.*

Bohlig's reagent for ammonia. I. A solution of 1 p. mercuric chloride in 30 p. water. II. A solution of 1 p. potassium carbonate in 50 p. water. Free ammonia and that combined with carbonic acid produce a white turbidity with solution I. If this reaction is first brought about upon the addition of solution II, the ammonia is combined with other acids.

Bonastre's reaction for myrrh. Strips of filter-paper are saturated with tincture of myrrh and after drying moistened with a drop of nitric acid. In the case of genuine myrrh a violet color is produced.

Borntraeger's aloe reaction. An alcoholic extract of aloes is shaken with benzin. The benzin solution after separation from the alcoholic layer and upon the addition of a trace of strong ammonia water is slightly heated while shaken. Aloes (also other substances, such as rhubarb, curcuma, galls, catechu) effect a violet coloration of the ammoniacal solution.

Bouchardat's reagent for alkaloids. (Iodine in potassium iodide.) 10 g. of iodine and 20 g. of potassium iodide are dissolved in 500 g. water. With the aqueous solution of most alkaloids this reagent produces reddish-brown precipitates.

Boudart's test for the distinction between fatty oils. The oils are mixed with nitric acid, sp. gr. 1.45 to 1.50. In the case of genuine cod liver oil carmine-red coloration is gradually produced.

Boudet's reagent for fatty oils is fuming nitric acid. Upon the addition of 5 p. c. of this acid olive oil becomes solidified. See *Barbot*.

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* Read at the Montreal meeting of the American Pharmaceutical Association, August, 1896.

* Continued from p. 183.

Brand's reaction for quinine and quinidine. The salts of both alkaloids, triturated with a little chlorine water, are colored green upon the addition of ammonia. (Thalleiochin reaction.) If to the solution of the alkaloids, after the addition of a slight excess of chlorine water, ammonia water is added drop by drop, a green flocculent precipitate is first produced which dissolves with a green color in an excess of the ammonia water.

Brand's reaction for fluorine in beer. This is a modification of *Nivièr's* test (q. v.) The fluorine in the precipitate is converted into hydrogen fluoride by means of sulphuric acid, and the former acid identified by means of its etching properties. For details see Zeitschr. f. d. ges. Brauwesen, 1895, p. 317.

Braeutigam-Edelmann's test for horse meat. 50 g. of the meat to be tested are boiled with 200 g. of water for one hour. The filtered extract is evaporated to one-half its volume. After the albumen has been removed by means of dilute nitric acid, iodine water is added so as to form a layer. Horse meat, on account of its large percentage of glycogen, produces a burgundy-red zone. Starch and dextrin interfere with the reaction: the former producing a blue, the latter a red color.

Braun's test for glucose. A solution of glucose heated with a few drops of a solution of picric acid (1:20) produces a deep red coloration.

Braun's nitric acid reaction. Upon the addition of a small quantity of aniline sulphate and subsequently of concentrated sulphuric acid to a solution of a nitrate (or of free nitric acid) a violet-blue coloration results.

Bronardel and **Boutney's** reaction for the distinction between ptomaïnes and plant alkaloids. I. With potassium ferricyanide and ferric chloride ptomaïnes produce a blue color. II. With the aid of a quill and the solution of the alkaloid or ptomaïne some words are written on silver bromide paper. After the paper has been laid aside for ½ hour, protected against the light, it is developed with hyposulphite. In case of ptomaïnes the script appears black, but not in case of plant alkaloids. (Morphine also yields reaction I. [comp. *Kieffer's* reaction]; in fact none of the reactions based on the reducing properties can be considered characteristic.)

Bruecke's reaction for the coloring matter from bile. See *Gmelin's* reaction.

Bruecke's biuretreaction for albumenous substances. Coagulated albumen assumes a handsome violet color when treated first with dilute copper-sulphate solution, and, after removal of the excess of this reagent, with dilute soda solution. Comp. *Rose's* biuretreaction.

Bruecke's reagent for glucose. 5.5 g. freshly precipitated, moist bismuth subnitrate are boiled for 10 minutes with a solution of 30 g. potassium iodide in 100 g. water. Then 5 g. of 25 p. c. hydrochloric acid are added. Glucose (diabetic urine) effects reduction with formation of a brown or black coloration.

Brullé's test for foreign oils (cotton seed oil) in olive oil. 10 ccm. oil are boiled with 0.1 g. of pulverized albumen and 20 ccm. nitric acid. As soon as all of the albumen is dissolved, the genuine oil is almost colorless; upon cooling, turbid and straw-yellow. The color remains the same after standing 24 hours and the liquid solidifies. In the presence of cotton seed oil the liquid becomes orange to brownish-red upon solution of the albumen. As a rule no solidification takes place.

Brunner's reaction for glucosides. Upon heating with bile and sulphuric acid a red color is produced (reversed *Pettenkofer's* reaction).

Buckingham's reagent for alkaloids is a freshly prepared solution of 1 g. ammonium molybdate in 16 g. of concentrated pure sulphuric acid. Heat is applied until the solution is clear. The reagent yields precipitates of different color with various alkaloids. Comp. *Hager*, Pharm. Praxis, I, 209.

Cailletet's reagent for fatty oils is a mixture of 12 parts phosphoric acid, sp. gr. 1.44, 7 parts sulphuric acid, sp. gr. 1.84, and 10 parts nitric acid, sp. gr. 1.37. According to other authorities it is nitric acid saturated with nitrous acid.

Cailletet's test for copper in oils. 10 ccm. oil are shaken with a solution of 0.1 g. pyrogallic acid in 5 ccm. ether. If copper is present a brown coloration and turbidity results.

Campani's reagent for glucose is a mixture of concentrated lead acetate solution with dilute copper acetate solution. Cane-sugar does not change the solution, glucose reduces the copper salt.

Capezznoli's reagent for sugar consists in the precipitation of ferric hydroxide with an excess of potassa solution. If sugar is present a dark orange-yellow ring is produced near the upper zone of the precipitate.

Caprauika's reaction for the coloring matter from bile. A solution of bromine in chloroform is added to the urine in question. In the presence of coloring matter from bile a greenish coloration is produced, which upon the addition and shaking with hydrochloric acid is conveyed to the acid.

Carlinfanti's modification of *Baudouin's* test (q. v.). After shaking the oil with the hydrochloric acid containing sugar the mixture is allowed to clarify. If sesame oil is present the hydrochloric acid appears purplish red. This color is permanent after the addition of three parts of water, whereas similar coloration, due to the presence of pure olive oil, disappears upon subsequent dilution.

Carpené's reagent for tannin (in wine) is a cold saturated solution of zinc acetate in 5 p. c. ammonia. Tannin causes a precipitation of this reagent.

Castle's reagent for bromine and iodine is dichlorbenzene sulphamide. The solid reagent or its solution in chloroform is added to the solution of the halide. From iodides and bromides the haloides are liberated as with free chlorine and can be recognized by the color they impart to carbon disulphide or chloroform.

Cazeneuve's test for coal tar dyestuffs in wines. The wine is shaken with yellow mercuric oxide. The filtrate from natural wines is colorless. If aniline dyes are present it is distinctly colored.

Christen's reaction for albumen. Tannin produces a turbidity, respectively a precipitate with a solution of albumen.

Clarus' reagent for solanine is chromic acid solution, with which the alkaloid produces a sky-blue color.

Conrady's test for cane sugar (in milk sugar). 1 g. milk sugar is dissolved in 10 ccm. water; 0.1 g. resorcin and 1 ccm. hydrochloric acid are added and the mixture boiled for five minutes. In the presence of cane sugar a reddish coloration is produced.

Contejean's test for free hydrochloric acid in the stomach juice. A drop of the stomach juice is heated with cobaltic hydroxy-carbonate in a watchglass. If hydrochloric acid is present, cobaltic chloride is found, which colors the solution blue upon evaporation.

Cotton's phenol reaction. See *Lex's* reaction.

Crace-Calvert's reaction for fatty oils. The oils are treated with sulphuric acid and nitric acid of given concentration, or with phosphoric acid and nitro-hydrochloric acid and the color reactions are observed. Or the oils are treated with soda lye, either directly or after the addition of hydrochloric acid and changes in color and consistency observed. For detailed information see *Benedikt*, Analyse der Fette, II. Aufl., 307.

Creuse's test for salicin in quinine. Potassium bichromate and dilute sulphuric acid produce no change with quinine. If salicin is present the odor of salicylic aldehyde is produced.

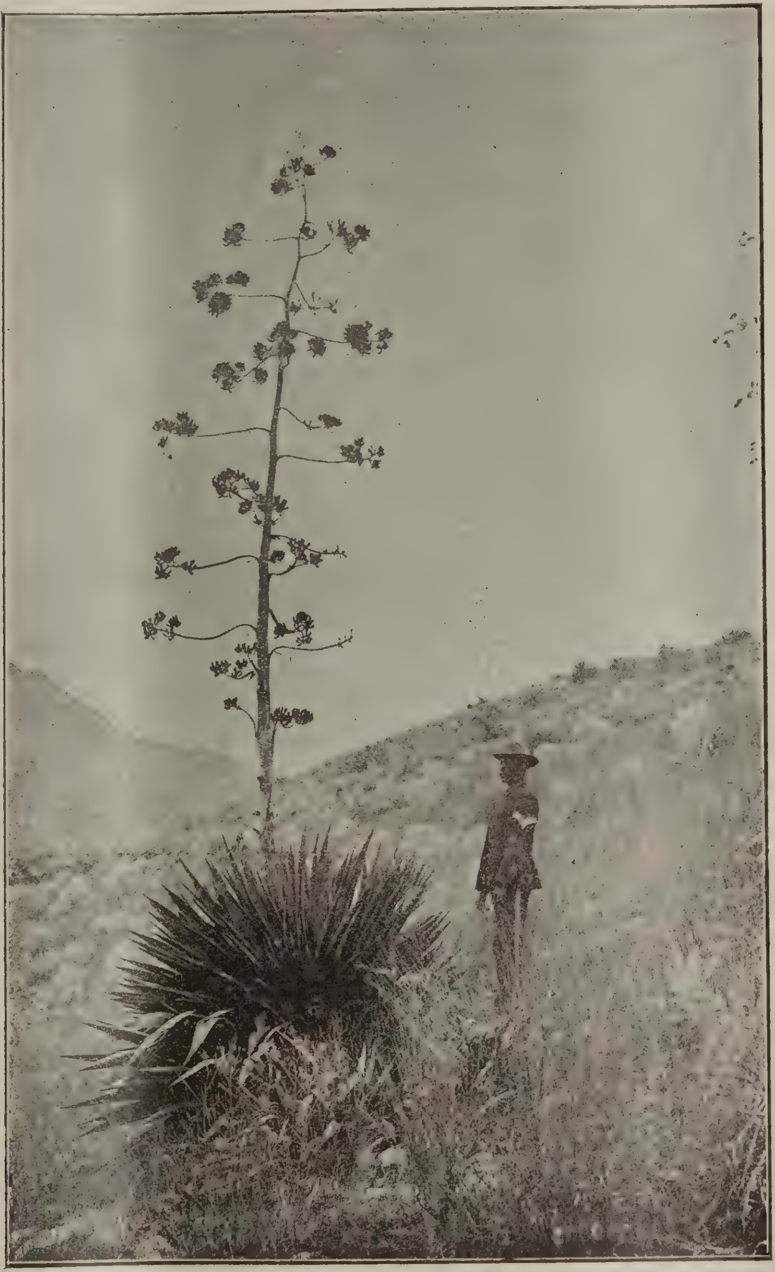

Plate 1. **Agave Palmeri.**

[From Seventh Report of Missouri Botanical Garden by permission of the Director.]

Cronzel's test for vegetable and animal fats in vaselin. Upon trituration with permanganate solution the presence of such fats produces a brown coloration.

Cripp's and **Dymond's** test for aloes. 0.05 g. aloes or the corresponding residue left upon evaporation are triturated with 16 drops of concentrated sulphuric acid. Then 4 drops of nitric acid, sp. gr. 1.4, and 30 g. water are added. A coloration varying from orange to carmine is produced, which is darkened to a deep wine-red upon the addition of ammonia. (Rhubarb, senna, frangula interfere with the reaction.)

All aloines are precipitated by ferric chloride or lead acetate. Barbaloine and Nataloine are colored carmine-red by cold nitric acid, Soc aloin and Curaç aloin are colored red by fuming nitric acid.

Barbaloin, dissolved in a drop of concentrated sulphuric acid, is colored red upon the addition of nitric acid, Nataloin blue.

Dahlmann's reagent or testing paper is a very dilute solution of gold and sodium chloride. Bleached and unbleached sulphite cellulose, sulphate cellulose and soda cellulose produce a reddish-brown color, wood-fibre a yellow color, and bleached straw paper no color.

Danielewsky's test for aromatic substances in blood etc. An azo-reagent (diazo sulphanilic acid ?) is added, the solution slightly acidified with hydrochloric acid and then made alkaline. The presence of aromatic compounds is indicated by the formation of an orange-red color.

David's alcoholic acetic acid for the examination of fatty acids consists of 300 ccm. of 95 p. c. alcohol and 220 ccm. of a mixture of equal volumes of glacial acetic acid and water. This reagent dissolves only the liquid olefinic acids from a mixture of fat acids, whereas the solid fatty acids remain undissolved.

Davy's test for arsenic. See *Marsh's* test.

Davy's test for phenol. Molybdic acid dissolved in concentrated sulphuric acid produces a violet coloration with phenol.

Day's test for mucus. The formation of a blue color upon the addition of 1 to 2 drops of oxidized tincture of guaiac (old, or shaken with air) to urine indicates the presence of mucus.

Deiss' modification of *Labiche's* test for cottonseed oil. See *Labiche.*

Delf's reagent for alkaloids. See *Mayer's* reagent.

Denigés' reagent for the detection of nitrous acid.

1.) a) A solution of phenol 1 g. and 4 ccm. sulphuric acid in 100 ccm. water;

b) A solution of mercuric oxide 3.5 g. in 20 ccm. glacial acetic acid, and 100 ccm. water; ½ ccm. of sulphuric acid is added and filtered.

Equal volumes of a) and b) are mixed, heated to the boiling point and 1 to 2 drops of the solution to be tested are added. The presence of nitrite causes a red coloration. This reagent is the reverse of *Plugge's* phenol reaction and was first mentioned by this author.

2.) Two ccm. aniline are dissolved in 40 ccm. glacial acetic acid and the solution diluted with water to 100 ccm.

5 ccm. of this solution and a requisite amount of the solution to be tested (1 drop to 10 ccm. according to concentration) are boiled. The presence of a nitrite is indicated by the formation of a straw-yellow to orange color, which becomes red upon the addition of an acid.

3.) A solution of 1 g. resorcin in 100 ccm. water and 10 drops sulphuric acid. Four drops of the solution to be tested, 2 ccm. of pure sulphuric acid and 5 drops of the resorcin are shaken. Nitrous acid produces a carmine or violet coloration.

Denigés' reagent for hydrogen peroxide is a mixture of 1 ccm. of a 10 p. c. aqueous ammonium molybdate solution and 1 ccm. concentrated sulphuric acid. Hydrogen peroxide produces an intensely yellow color with this reagent.

Derbassin's test for nitric acid. See *Roehmont's* test.

Deubnèr's test for coloring-matter from bile. See *Gmelin's* reaction.

De Vry's herapathite reaction for quinine. To 8 parts of quinoidine sulphate dissolved in 8 parts of 5 p. c. aqueous sulphuric acid an iodine solution (1 p. iodine, 2 p. potassium iodide and 100 p. water) is gradually added. The resinous precipitate, after washing and drying, is dissolved in six times its weight of 92 to 94 p. c. alcohol, the solution filtered and evaporated. The residue is dissolved in five times its weight of alcohol. This solution produces with solution of quinine sulphate a precipitate of iodosulphate of quinine.

De Vry's quinine test (chromate test). To a solution of 1 g. quinine, dissolved in 45 ccm. boiling water, 2.5 g. of neutral potassium chromate are added; the solution is cooled to a temperature of 15°; and after an hour the crystallized quinine chromate is filtered off. To 10 ccm. of the filtrate one drop of soda solution is added or sufficient to effect a reddening of phenolphthaleïn paper. If the quinine was free from other cinchona alkaloids, the solution remains clear, also upon heating; if other alkaloids were present a turbidity is produced.

Dietrich's reaction for uric acid. Upon the addition of sodium hypochlorite solution containing bromine to a solution of uric acid an unstable rose-red color is produced.

Di Vetere's test for castor oil in olive oil. Upon shaking a sample of the oil with concentrated hydrochloric acid three layers are formed if castor oil is present.

Dobbin's reagent for caustic alkali is a solution of mercuric iodide, potassium iodide and ammonium chloride. Caustic alkalies, including ammonia, produce a yellowish to reddish-brown color or precipitate. The reagent is prepared by adding a solution of mercuric chloride to a solution of 5 g. potassium iodide until a permanent precipitate is produced. This is removed by filtration. Then 1 g. ammonium chloride is added and sufficient dilute caustic soda solution until again a permanent precipitate is produced. The filtrate is diluted to 1 liter.

This reagent is serviceable for the detection of traces of alkali in potassium and sodium carbonate.

Donath's test for nitrogen. 0.05 g. substance are heated with 1 g. potassium permanganate and 20 ccm. pure, saturated potassa solution to boiling. If necessary more permanganate is added to effect permanent coloration. Upon cooling the mixture is diluted with water, the excess of permanganate destroyed by the addition of alcohol, the precipitate removed by filtration and the filtrate tested for nitric acid according to known methods.

Donné's test for mucus (in urine). To the sediment, obtained by removing the supernatent liquid, a fragment of caustic potassa is added and the mixture is stirred. Mucus is colored greenish and gelatinizes to a lumpy mass; a gelatinous sediment is partly dissolved, partly converted into a flocculent precipitate.

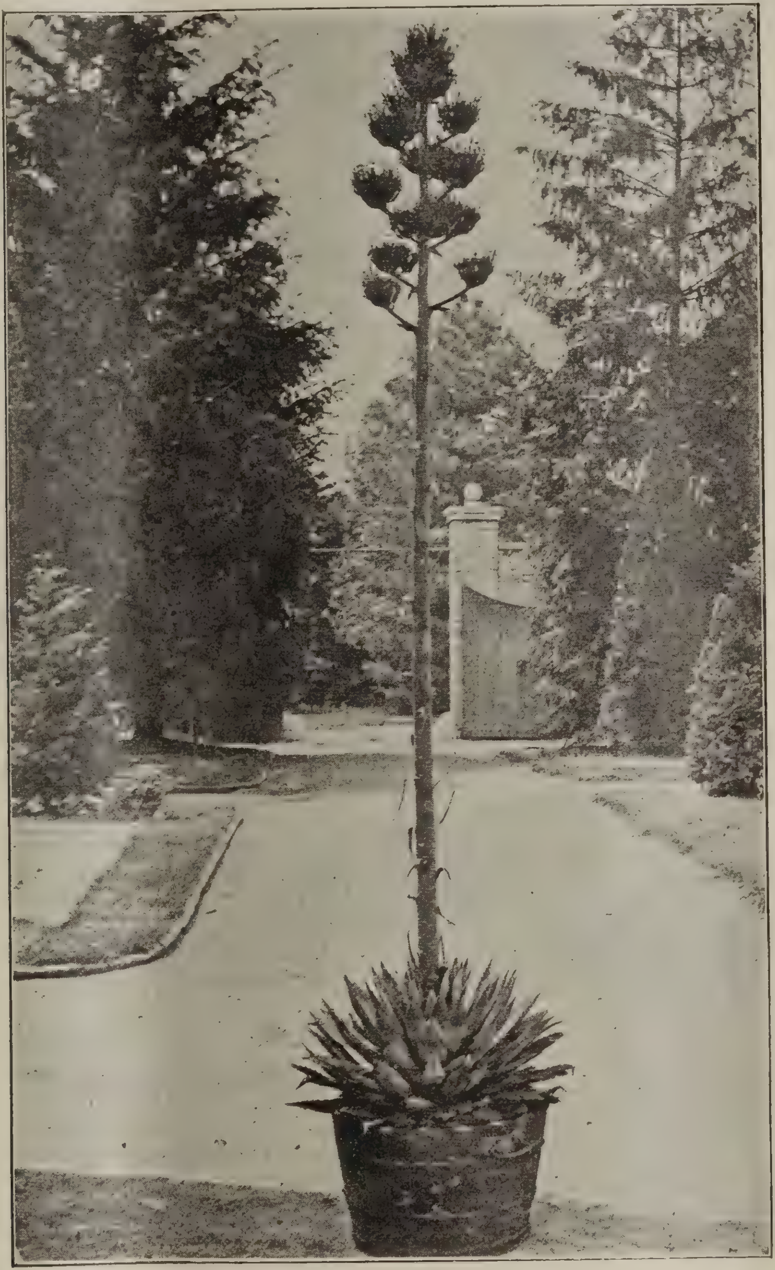

Plate 2. **Agave applanata.**

[From Seventh Report of Missouri Botanical Garden by permission of the Director.]

Dragendorff's reagent for alkaloids. (Potassium-bismuth iodide). Bismuth iodide is heated with a solution of potassium iodide, the mixture filtered while hot, and to the hot filtrate an equal volume of cold concentrated solution of potassium iodide is added. The concentrated solution is permanent, the dilute solution not. According to *Frohn* the reagent is prepared by suspending 1.5 g. of freshly precipitated bismuth subnitrate in 20 g. water, heating the mixture to the boiling point and adding 7 g. potassium iodide and 20 drops of hydrochloric acid. The reagent produces a reddish-brown precipitate with alkaloids, but also with albuminous substances.

Comp. *Mangini's* and *Thresh's* reagent.

Dragendorff's test for alcohol in volatile oils. Metallic sodium is added to the oil in question. If alcohol is present hydrogen is generated and a brownish color is produced.

Dragendorff's test for coloring-matter from bile. See *Gmelin's* test.

Drechsel's test for "Gallensäuren." See *Pettenkofer's* reaction.

(To be continued.)

MONTHLY REVIEW.

Chemistry.

Chemistry of Human Milk.

The analysis of Fr. Soeldner and Wm. Camerer shows that human milk contains less proteïd matter than was previously supposed. 100 grams of milk collected, on the average, in the second week after parturition, contain 1.52 proteïd, 3.28 fat, 6.5 sugar, 0.27 ash, 0.05 nitric acid, 0.78 unknown extractives, 12.4 total dry residue. The unknown extractives, which are almost absent in cow's milk, are increased in the colostrum.

[J. C. S., 70^{II}, p. 378; from Zeit. Biol., 33, p. 43.]

Mercury Silico-fluoride as Antiseptic.

The experiments of Hallion, Lefranc and Ponpinel have shown the silico-fluoride of mercury to be a valuable antiseptic. On *Bacillus pyocyaneus, Bacillus diphteriticus* and *Bacillus anthracis* it acts twice as powerfully as sublimate. Inasmuch as experiments on animals have shown it to be a much weaker poison on the animal organism, the authors recommend it highly as antiseptic. It can be used in aqeous solution 1:1000 or as vaselin ointment 1:2000.

[Apt. Ztg. 11, p. 516; from Rep. de Pharm. [3], 7, p. 124.]

Detection of Nitrites.

P. Sabatier reports on a reaction of cuprous compounds, which can be used for the identification of nitrites. If to a solution of a small quantity of sodium nitrite in concentrated sulphuric acid a few fragments of cuprous oxide are added, these are dissolved with the formation of an intensely violet to purplish color. All cuprous compounds as well as the cuprous-cupric derivatives yield the same reaction. Metallic copper, obtained by the reduction of CuO by means of hydrogen, reacts with a stronger evolution of NO.

Cupric compounds do not react. Neither is any color produced by mercurous or mercuric derivatives, or by salts of lead, silver, tin, manganese, cobalt and nickel.

[Apoth. Ztg. 11, p. 575; from Chem. Ztg. 20, p. 521.]

A New Diastatic Ferment.

MM. Bertrand and Malèvre, who have been working upon pectase, a new diastatic enzyme, find that it is very widely distributed among plants; so widely that they feel justified in saying that it may be regarded as universally diffused in green plants.

It is especially abundant in leaves and probably spreads to the other organs. It may be prepared from alfalfa or clover by braying in an iron mortar full grown plants, whose juices are then expressed. This fluid is saturated with chloroform to prevent alteration by micro-organisms and set aside from 12 to 24 hours in an open flask protected from light. It then undergoes a special coagulation which renders it easy to filter. To the clear liquid twice its volume of 90 percent alcohol is added, which throws down a white precipitate which is collected and dissolved in a little water. After twelve hours it is filtered and the almost colorless liquid which runs through is received in four to five volumes of alcohol. The pectase separates anew and is collected and dried in a vacuum. In this way a liter of juice yields 5—8 g. of a white, non-hygroscopic substance, very soluble in water, which produces a vigorous pectic fermentation. A 1 percent solution of pectin will be coagulated in forty-eight hours by the addition of $\frac{1}{1000}$ of its weight of the pectase from alfalfa, or $\frac{1}{1600}$ of the pectase from clover. [Bot. Gaz. 22, p. 65;
from Jour. de Bot. (1896).]

Potato Poisoning.

A number of soldiers in the garrisons in Alsace and in Lyons, at different times, were seized with symptoms indicating poisoning after eating potatoes of doubtful quality. Those used in Alsace were chiefly new and unripe; those consumed by the Lyons garrison were old, having already sprouted.

These occurrences led to a chemical examination with especial reference to the solanine present under various circumstances and gave very interesting results.

Fresh potatoes, not sprouted, from November to February contain from 0.04 to 0.046 percent of solanine; when peeled from 0.02 to 0.25 percent. Old potatoes that have sprouted in the period from March to July may contain from 0.08 to 0.116 percent. When made to sprout artificially and the sprouts were about one tenth of an inch long, 0.212 percent was found. It was especially abundant in the sprouts themselves; in samples one third of an inch long 5.0 percent of solanine was found. With the growth of the sprout it diminishes; in specimens about three inches long only about 2.7 percent of the alkaloid being found.

Soft withered potatoes contained 0.144 percent, a black moulded piece a year old contained 1.34 percent.

The dwarf potatoes produced by sprouting in the cellar were particularly rich in solanine containing as much as 0.52 percent. The conclusion is that potatoes to be poisonous must contain an exceptional proportion of solanine and be old, withered or sprouting.

[New York Medical Journal, 64, p. 127; from Centralblatt f. d. gesammte Therapie, July (1896).]

Products of the Destructive Distillation of Linseed Oil.

In an interesting paper read at the Montreal meeting of the Am. Pharm. Ass'n., Prof. F. P. Sadtler demonstrated that practically the same products are obtained when linseed oil is distilled under pressure as when codliver oil is subjected to the same treatment. Prof. Engler of Karlsruhe at the World's Fair Congress of Chemists exhibited specimens of petroleum obtained by him from fish oil. Later he also isolated solid paraffin. The same products were obtained by Prof. Sadtler from linseed oil and exhibited at Montreal. He also expects to obtain similar results from the destructive distillation of other vegetable fats.

These observations are of theoretical interest because they assist in exploding one sided views with regard to the formation of natural petroleum.

They are, however, also of great practical importance. If instead of allowing the hydrocarbons to escape which are formed when linseed oil is heated, they are compelled to flow back, the yield of boiled oil is considerably increased. In one experiment as much as 50 p. c. of distillate was obtained. The boiled product which results if the oil is heated in an autoclave instead in an open vessel or a still therefore will contain products identical with ordinary petroleum. This is suggestive of some delicate problems for the forensic chemist and lawyer.

Copper in Foods and Drinks.

Dr. B. H. Paul and A. J. Cownley criticize methods for determining the copper content of organic substances used by Vedrödi and by Lehmann and propose the following as ready and accurate.

One hundred grams of the material are carbonized in platinum, the ash extracted with strong hydrochloric acid, filtered through an acid-washed filter, the filter washed with hot water—all into a porcelain dish. The residue which is insoluble in hydrochloric acid is treated with a few drops of strong nitric acid, then aired and ignited. The ignited mass is treated with strong hydrochloric acid and the filtered solution is added to the first portion. The hydrochloric acid solution after concentration to about 30—40 cc. is placed in a weighed platinum dish and the copper precipitated by pure zinc. If the deposited copper after weighing is not of a pure copper color, it is dissolved in a little nitric acid made up to a known quantity and the copper determined colorimetrically in an ammoniacal solution.

By this method the following results, giving the amount of copper found in various alimentary substances, were obtained. The copper content is indicated in number of parts per 10,000 parts of the substance investigated.

Oysters	1.81—3.03
Cocoa	0.29—0.58
Brandy	0.01—0.05
Whisky	0.04
Preserved Peas	0.54—1.44

For comparison with these results, the following by Vedrödi are added.

Winter wheat	2.5—8.6
Summer wheat	2.5—3.0
Barley	0.1—0.9
Linseed	1.4—1.9
Peas	0.9—1.5
Mustard Seed	0.9—1.0

[Pharm. Journ., 1896, p. 442.]

A New Apiol.

G. Ciamician and P. Silber have examined the higher fraction of dill oil, which constituted about 30 p. c. of an oil distilled by Schimmel & Co. from East Indian seed. The product was subjected to fractional distillation. About two-thirds consists of the new apiol, $C_{12}H_{14}O_4$, which distills at 162° under 11 mm. pressure, and at about 285° under ordinary pressure with slight decomposition.

The new apiol, like that obtained from parsley, contains two methoxy groups, viz. $C_{10}H_8O_2\ (OCH_3)_2$.

In distinction from the apiol from parsley, the apiol from dill oil is an oily, almost odorless liquid, which does not congeal when exposed to a low temperature. It is insoluble in water, but soluble in the ordinary solvents, and is not affected by aqueous alkali. Like the known apiol it is converted into an isomer, isapiol, when boiled with alcoholic potash or with sodium ethylate. The isapiol forms colorless prisms melting at 44°.

Apparently the two apiols contain the same nucleus, viz. tetraoxybenzene, and differ from each other in the relative position of the methylene group to the two oxymethyl groups.

[Pharm. Ztg. 41, p. 521; from Ber. 1896, No. 11.]

Titrimetric Determination of Copper.

M. Rupean uses a solution of picric acid of known strength and precipitates with it the copper from ammoniacal solution. The copper solution is titrated until it is green; then the copper picrate is allowed to precipitate and the titration is continued until the solution is yellow without a greenish tint.

Of a solution of 7.2 g. picric acid in ammonia diluted to one liter each ccm. precipitates 1 mg. copper from its ammoniacal solution. The copper solution is diluted so as to contain 1 gram copper in a liter. If the solution contains silver and zinc besides copper no modification is necessary since the picrates of these metals are soluble in ammonia. If lead is present tartaric acid is added, because in the presence of the ammonium tartrate formed the lead salt also remains in solution. Iron is first converted into the ferric salt and then precipitated with ammonia, when the lead can be estimated as usual.

[Apt. Ztg. 11, p. 576.]

Botany and Pharmacognosy.

Acid Root Secretions.

Dr. Friedrich Czapek denies that the acid secretion from root tips is hydrochloric acid or any of the organic acids suspected by various investigators at various times. The only free acid found is carbonic acid exhaled as a result of the respiration of the living root. The acid reaction seen when roots are grown above blue litmus paper is due in most cases to primary potassic phosphate or more rarely to primary potassic oxalate.

[Ber. d. deutsch. bot. Gesellsch., 14, p. 29.]

An Old Locust Tree.

At Britz, a suburb of Berlin, stands a locust tree, *Robinia pseudacacia*, that was sent in 1720 from America in a flower pot to the then owner of the place and planted in its present location. As a result of the good care bestowed upon it, the plant flourished and was a pleasure to many interested in it, among them King Frederick William IV. Fifty years ago it was barely able to support its wide-spreading branches and iron supports were made use of. Since then, however, it has suffered greatly from storms. Not far from it is a shoot from the parent tree which has a diameter of more than a meter.

[Die Natur, 45 (1896), p. 302; from Gartenflora (1896), Heft 10.]

A New African Caoutchouc Tree.

In the colonies Goldcoast and Lagos it has recently been ascertained that the tree known as Ire, Ireh or

Ereh, *Kickxia Africana*, furnishes valuable caoutchouc. The caoutchouc export from these places has been by this means extraordinarily increased. The *Kickxia* reaches a height of 18–21 m. Each tree furnishes during the rainy season 10–15 pounds of caoutchouc. The seeds of the *Kickxia* are often deceptively mixed with those of the *Stropanthus.* To obtain the sap an incision of from 2—3 cm. breadth is made which reaches the inner bark and extends the whole length of the trunk. Incisions leading obliquely to the main tap are made on both sides in order to conduct all the sap into the basin at the foot of the tree.

The sap is prepared for caoutchouc in two ways. It is either filtered or allowed to evaporate for 14 days in a trough and then pressed. This caoutchouc brings 9 d. to 1 s. per pound. The tree seems to adapt itself easily to cultivation, a characteristic not found in the case of the Landolphias.

[Gaea 32, p. 506; from Deutsches Kolonialblatt.]

Genuine and Poisonous Star Anise.

Dr. Walter Laurén, as the result of a thorough study of the fruits of the true star anise (*Illicium verum* Hook., F.,) and the poisonous article (*I. religiosum* Lieb.) that sometimes becomes confused with it, finds that both anatomical and chemical differences exist. The columnar cells of the eudocarp of *I. religiosum* are smaller than those of the genuine drug because shorter. The transition of the schrenchyma cells on the surface of deshiscence into the palissade cells in *I. religiosum* is very sharp; in the true star anise very gradual. The walls of the schrenchyma cells become gradually thinner and thinner and the cells finally pass over into the palissade form. In *I. verum* the palissade cells have an average length of 500 μ; in *I. religiosum* 375 μ.

If developed seeds occur, which is rarely the case in the false anise, the form and size of the alemone grains furnish a basis for distinction. Sections of the endosperm laid in absolute alcohol to remove the oil and to harden the alemone grains are observed in alcohol, and water is gradually added. In *I. verum*, the grains have a rough surface of glandular appearance; round or roundish grains are the rule; size 11 to 22 μ, averaging 12 μ. In *I. religiosum*, the grains are smooth, shining, oval or eliptical, seldom round, in size varying from 7.5 to 15 μ, averaging 11.5 μ.

A very reliable and easy chemical method of distinguishing them rests on the presence in the true anise, of anethol, and its absence in the false. The carpels to be examined are broken into small pieces, the seeds are removed and the remaining fragments of carpel are boiled in 1—2 cm. of alcohol for a few minutes until the liquid takes on a weak but distinct yellow color. The liquid is then decanted into another test tube and diluted with water. The false anise gives a clear fluid, while the alcoholic extract of the true star anise shows a milky turbidity due to the precipitating anethol. If these extracts are evaporated in watch glasses, the false drug gives beautifully developed crystals (of sikimic acid) in great abundance, while the true article gives only very small, indistinct crystals or yields sugar.

[Schweiz. Wochenschr. f. Chem. u. Pharm., 34, p. 278.]

The Spraying of Plants.

Nothing more remarkable has taken place in the history of botany than the development of methods for the protection of cultivated plants against the attacks of fungi and insects, especially by spraying, and the consequent encouragement given to the study of the life history of fungi. It is scarcely more than a decade since the first impetus was felt, its inception being traceable to the discovery of the value of Bordeaux mixture as a fungicide and Paris green as an insecticide. The former was first used in France and the latter in central United States. The importance of these discoveries cannot be overestimated, and the extent and variety of the practical and scientific results which have followed can only be fully appreciated by one studying the subject. It is therefore a valuable service which Mr. E. G. Lodeman has rendered to practical and scientific men alike by the publication of a work on the general subject of spraying.

In four hundred closely printed pages he has recorded a great number of facts and opinions, and given a clear survey of the growth of the subject and its present status. Beginning with the history and principles of spraying in general, he traces its rise and adoption in foreign countries and in America, together with improvements in machinery for its application; then discusses the action of fungicides and insecticides upon the parasite, the host, and the soil, and devotes the last third of the work to descriptions of fungous diseases and insect enemies of many kinds of plants, with directions for treatment.

There are several aspects in which the work is a specially valuable contribution to scientific literature. The chronological study of the subject in its different lines of development and from various geographical centers, with the abundant reference citations, presents a record of lasting importance, although necessarily limited by the size of the volume.

The fact that America leads in the study of plant diseases, in devising new remedies, perfecting those already known, and in the readiness with which the cultivator accepts and applies the suggestions of the investigator is cause for congratulation, as it augurs well for the continued growth of pathology and incidentally of other branches of botany in this country.

The number of diseases brought to light and the number of remedies suggested have been so perplexingly numerous that the cultivator and the investigator alike will welcome the part of the work dealing with specific diseases and their treatment. Although necessarily brief, it is sufficient for the guidance of the cultivator, and affords the student a needed survey of the field. It is fortunate that insects and fungi are examined with equal thoroughness in this work, as it gives an opportunity to compare the results of the labors of entomogists and mycologists. [Bot. Gaz. 22, p. 61.]

A Rare Preparation of Indian Hemp.

M. E. Lepinois reports a preparation of Indian hemp from Egypt that is seldom met with in commerce. It consists of somewhat elongated masses which may be smooth and fusiform or thicker and more or less furrowed transversely. These furrows indicate plainly that the mass when fresh is somewhat waxy and is moulded into shape in the hand. The color is brown with a greenish tinge. The odor is not marked but when fresh recalls that of calamus. It is only when heated that it gives the odor of Indian hemp. The masses weigh from 10 to 40 grams and have an average density of 1.338. The easily powdered mass when examined microscopically is found to consist of hairs imbedded in an amorphous yellowish or brown mass made up of glandular trichomes filled with resin. These hairs, sometimes entire, sometimes broken, have the structure characteristic of the *Cannabinaceæ*. They are unicellular and covered externally with small mammilose papillæ. They enclose near the base a resinous material similar to that which is distributed througout the mass.

At first sight the drug might be confounded with Ladanum, but the form of the hairs contained is decisive. Those of the *Cistaceæ* are multicellular and bear a gland at their extremity. A chemical examination showed the presence of a resin, brittle, with pronounced odor but lacking characteristic taste. It is completely soluble in alcohol, ether and bisulphide of carbon, insoluble in potash, soda and ammonia. It is little acted upon in the cold by acids.

The residue remaining after extraction with water and alcohol is composed in part of trichomes and in part of insoluble minerals. On incineration the carbonate and sulphate of calcium, peroxide of iron and silica were obtained. The results of the examinations were as follows:

Aqueous extract	10.80 percent.
Alcoholic extract	32.00 percent.
Insoluble organic matter	33.20 percent.
Ash	24.00 percent.

Egypt is not the geographic source of this drug; there the cultivation and importation of Indian hemp is forbidden by law. It is, however, smuggled in and sold by Armenians. In Syria the drug is cultivated and the resin prepared. Probably the specimens examined were from Syria; it resembles in aspect the product made in different points in Galilee and Asia Minor and called "chirros", a name closely resembling "churrus" employed in India for the resin of the Indian hemp. The "chirros" is a kind of confectionery to which hashish is added. Although the form of this preparation is here found no saccharine substance is present.

[Repert. d. Pharmacie (1896), June, p. 241.]

Economic Uses of the Agaves.

In a recent monograph on the Agaves of the United States by Dr. A. Isabel Mulford, some interesting facts concerning the uses to which the Indians of the Southwest put this rather forbidding-looking plant, are brought out.

The fibre is used in making sacks, ropes, saddle-cloths and other articles. The softer parts yield food and drink as well as a soapy liquid used for washing. The flower stalks serve for fish poles and handles for lances and are important in building their habitations. Perhaps the best known product of the Agave is the Mexican national drink, pulque. At an age of about ten years when the plant is ready to send up its flowering stalk, a remarkable flow upward of the very sweet sap called *aqua de miel*, honey water, takes place. The central bud and leaves are cut out and a long cylindrical gourd inserted to receive the liquid. An average of three gallons per day for several months is furnished by a single plant. This is collected in vats made of rawhide, and allowed to ferment. The liquid becomes white, resembling half-turned buttermilk and acquires a strong yeasty odor, when it is said to be cool, refreshing, palatable and nutritious.

Agave Americana, *A. Mexicana* and *A. atrovirens* are especially used for this purpose.

By the distillation of the pulque the Mexicans make a fiery, intoxicating liquor going under a number of names, but most frequently known as *mescal*. The name *mescal* is likewise applied to an article of food much esteemed by the Indians of the Southwest. A large pit is prepared and lined with stones which are heated by a fire kept in the pit. When all is ready the Agave stems, from which all but the sweet, juicy stalks and young leaves have been trimmed, are heaped on the hot stones, covered with grass and earth and left to steam for two or three days. By this time all except the fibrous tissue is reduced to a palatable, nutritious, jelly-like mass. Dr. Havard says: "Cooking develops a large proportion of grape sugar which exists in combination with citric acid as a citro-glucoside. It is set free by exposure to heat or by application of cold water." He also says that the young leaves yield on pressure a juice which is slightly acidulous, laxative and diuretic, therefore a good antiscorbutic. The Apache Indians seek most eagerly after *A. Palmeri* [Pl. 1.] and *A. applanata* [Pl. 2.]. *A. Utahensis* is used by the Panamint Indians.

[Seventh Report of the Missouri Botanical Garden (1896), p. 58.]

Ainu Medicinal Plants.

The first part of the article on Ainu medicinal plants by Rev. John Batchelor and Dr. K. Miyabe, in part summarized in The May Review (p. 113) is continued. A number of additional plants and uses are worthy of note.

The young leaves of *Arctium lappa* L. after being softened by rolling them between the palms of the hands are applied to skin eruptions. They are occasionally used as an article of food after being boiled. A strong decoction of the bitter flower shoots of *Petasites japonicus* Miq. is taken for heavy colds and sometimes also used as food.

Artemisia vulgaris L. is used as a charm against evil, especially against disease and is frequently hung up in houses. The stem and leaves are boiled in a pan and the patient is made to inhale the steam by covering his head and the pan with a cloth.

Cynanchum caudatum Max. is used as both food and medicine. While good for any complaint, it is a special remedy for small-pox. When to wounds of all kinds a thick decoction is applied, the formation of pus is said to be prevented. Half cooked roots are said to have an intoxicating effect and to cause loss of all control over the limbs and to do away with all sensation of the skin. The root is dried and stored up for future use, but it is sometimes taken fresh, either roasted or boiled, and is said to have a very sweet taste. In time of epidemic sickness the root is chewed in its raw state and the juice blown from the mouth sometimes upon and over the afflicted person; sometimes all over the inside of the hut and through the doors and windows; and sometimes again about a house and even whole villages. When so used it is supposed to act as a kind of charm to drive away the demon of sickness. Those who use this plant so are generally intoxicated by it. It is also said to be very efficacious as an antidote to poison. It is used sparingly as a food and only when well cooked.

The decoction of the aromatic *Escholtzia cristata* Willd. is given to persons suffering from the after-effects of intoxication.

Daphne chinensis Lam. var. *brevifolia* is reported to be poisonous, especially the berries and the root. Some Ainu burn the roots to charcoal, powder and apply where there is internal pain, never to cut wounds.

The mistletoe, *Viscum album* L. is held by the Ainu, as by many other nations of northern origin, in peculiar veneration. As a medicine it is good for almost every disease, taken either in food or as a decoction. The leaves are preferable to the too sticky berries. It is believed to increase productiveness and hence the finely cut leaves are mixed with the millet and other seeds, and prayed over before sowing. A little is also eaten with the food. Barren women have been known to eat the mistletoe to cure them. Since the willow is regarded as a sacred tree, the mistletoe growing on this particular host is supposed to have the greatest efficacy. The fresh bark of the willow, *Salix multinervis* Fr. et Sar. is widely used as an application for cut and bruised surfaces. The finely shredded bark is softened in hot water and bound to the wound.

The bark of *Populus tremula* L. cut into fine shreds is bound to wounds to prevent the formation of pus.

The resin of *Picea Japanensis* Fisch. is sometimes applied to cut wounds to hasten healing. The softened leaves of *Smilax herbacea* L. are applied to heal affections of the eyes; they are also applied to skin eruptions and wounds.

Allium victorialis L. is used especially for colds and is sometimes hung by doorways as a charm against epidemic diseases.

The rhizome of *Acorus calamus* L. is extensively used. The decoction is said to cure pains of the stomach. It is also used for colds and headache.

Polyporus officinalis Fr. grows on larches; it has a very bitter taste. It is rubbed into painful places; it is used in a decoction as a remedy for stomachache.

[Pharm. Journ., 56, p. 442.]

Indian Hemp.

In an editorial in the *Indian Lancet* for May 16th the writer gives a description of the effects of this plant, which is consumed in enormous quantities in the East. In small doses it quickly relieves pain and induces sleep. In larger doses it produces the following effects: Shortly after taking a full dose a pleasant state of intoxication ensues. The consumer perpetually talks, giggles, and sings. Ideas of a delightful kind pass rapidly through his mind, and he is possessed with a feeling of complete happiness and contentment. After a time sleep sets in, generally accompanied by pleasant dreams. But if the dose is excessive, or if the individual is peculiarly susceptible, the consequences are such as to prevent a repetition of the indulgence.

The following vivid description, says the writer, is given by Dr. H. C. Wood of the effects he suffered from an overdose of this drug: A few hours after taking it he was writing a prescription when he became perfectly oblivious to surrounding objects. He continued to write, however, and, on looking up and seeing the patient lying in bed, thought that he had been many hours writing the prescription, and he apologized for remaining so long. He then returned home in a state of ecstatic happiness. He laughed and made comic gestures and imitated the motions of a violinist. He knew he was acting foolishly but could not control himself. This condition lasted for half an hour, and then a change set in. He felt uneasy and his limbs became numb, and he walked constantly about the house. His mouth and throat became painfully dry, and he experienced a strange feeling in his legs, as though they were not a part of his body. A foreboding, an undefined, horrible fear, as of impending death, took possession of him, and he sent for a physician. He had lost all power of measuring time. When the physician arrived the patient was put to bed, but the symptoms grew intensified, and he felt himself mounting upward and expanding until he filled all space. He himself says, "I have never experienced anything like the fearful sense of almost hopeless anguish and utter weariness that was upon me."

This drug, continues the writer, is a native of Western and Central Asia, although it is cultivated in many parts of Europe. The Indian variety only is used in European medicine. It has two principal forms, one consisting of dried leaves and small stalks, which is called bhang or siddhi in Hindustani, and hashish in the Arabic tongue; the other consists of the flowering shoots, and is called guaza by London drug brokers.

Although hemp is such a powerful drug, it is said not to be fatal, even in the largest doses. The odor is rather pleasant and the taste scarcely preceptible, and for this quality, says the writer, it lends itself, like arsenic, to criminal purposes. In India it is smoked both by Mahomedans and Hindus, either alone or with tobacco. It is also taken as an infusion. The commonest way of using it, however, is in a sweetmeat of a green color, which is composed of flour and various ingredients. Although its usual effect is the production of quiet happiness, and although it is said, like opium, to diminish crime, it sometimes produces furious delirium and renders the consumer perfectly reckless. The assassination of Justice Norman, for instance, in Calcutta, on the steps of the town hall, was perpetrated by a man under the influence of hashish. The Afghan chief, also, who murdered Dr. Forbes, in 1848, was known to have been intoxicated for days previously with charas or bhang. When the drug is consumed for any length of time it produces trembling and great muscular weakness. And a strange effect of it, occasionally, is a most ravenous appetite, which no quantity of food is capable of appeasing. But the astonishing effects produced in the warm East are never seen in colder England.

The use of hemp, says the writer, may be morally indefensible, nevertheless it serves most useful purposes. Some intoxicant appears to be a necessary food for the human nervous system. Hemp is, therefore, an excellent substitute for alcohol among the totally abstaining Mahomedans. It also enables the over-populated Asiatic countries to pull through their frequent famines in a way that would be impossible with Englishmen. And if we judge by the inoffensive Hindu it can not be said to be morally deleterious.

The use of bhang is as old as the hills. The ancient Chinese herbal called Rh-ya, written about the fifth century B. C., notes that there are two kinds of plant — one producing flowers and seeds, and the other flowers only. Many early Hindu works on medicine also, such as the Susruta and Charaka, describe hemp as a potent remedy for certain ailments; while Herodotus states that in his time it grew in India, and articles of clothing were made from it. The Scythians, he said, were in the habit of using it in their baths. They placed the seeds on red-hot coals, and exposed their bodies to the vapor. Early in the Middle Ages the use of bhang spread from India through Persia to the Arabians, but it was not until the sixteenth century that it was introduced into Europe. It did not take there, however, and during Napoleon's eastern expedition it was described as a new discovery by two French scientists. Thirty years later, in consequence of Dr. O'Shaughnessy's experiments in India, hemp became a permanent and valued addition to the British Pharmacopœia. The famous care-destroyer of the Greeks was, according to Royale, nothing else than Indian hemp. It has furnished our language, continues the writer, with rather an ominous word — assassin, derived from hashishin, the name of a band of Mahomedans whose murderous deeds terrified the crusaders, and who were so called from the fact that they used hashish in their religious rites. As for stopping the use of bhang by a royal commission, the writer says, we might as well try to keep swallows from building nests. Considering the antiquity and universality of its use, it is impossible not to conclude that hemp is as necessary to the Mahomedan and Hindu as tobacco or beer is to the Briton. And the balance of evidence points to its comparative harmlessness.

Practical Pharmacy.

Filling of Capsules with Powders or Pill-Mass.

In a paper read before the Scientific Section of the American Pharmaceutical Association at the Montreal meeting, Mr. W. C. Alpers traced the history of the gelatine capsule and also discussed the filling of capsules with powders and pill-mass. Inasmuch as there appears to be a great lack of information as to the proper manner for filling capsules it may be best not to merely abstract the paper, but to give the second part of the paper in full. For the historical introduction consult the original.

There exists a great diversity of opinion as to the proper way of dispensing medicinal media in gelatine capsules. While some pharmacists claim that a mass should always be prepared, others contend that the only proper way is to fill the mixture of the various items of the prescription in powder form into the capsule. Under certain circumstances both may be right. Physicians are not always explicit in writing prescriptions and often omit to state in what form they wish the medicine administered. If they would simply add "*fiat massa in capsulas dividenda*," or "*fiant pulveres in capsulas dividendi*," all doubts would be dispelled. But there are only a few who do this, and as long as the modus operandi is left to the judgment of the pharmacist, a definite rule should be adopted.

The public in general prefer capsules filled with powder, and all pharmacists know the sometimes very troublesome customer who will insist on having his 20 grains of quinine put into ten capsules, because "they act better that way." The argument that a dry powder is more readily dissolved or absorbed than a more or less compressed pill, is a very plausible one and hard to refute. In reviewing prescriptions on which capsules are ordered, we find that the majority, almost 65 percent are orders for pills, that is to say, they contain ingredients whose mixture will result in a pill mass. Vegetable extracts of more or less soft consistency, oils of various natures, articles like oxgall or ichthyol, and similar drugs, all these can only be prepared in pill form; for to make powders of them would require an addition of so much absorbing powder, as to make the powders unreasonably large. To this class we must also count those prescriptions that contain deliquescent salts or such chemicals which by their mixture will turn moist or liquid. There can be no question about such prescriptions and our investigation is therefore restricted to prescriptions that are composed only of dry ingredients or in which the amount of liquid medicaments, like a few drops of some ethereal oil, is so small that it will be readily taken up by the solid ingredients without the addition of any absorbing powder. What is ordered in such cases, powders or pills?

Let us take analogous cases. Would a pharmacist think of changing a prescription for pills into one for powders, or one for powders into a liquid? Is it not the rule to dispense conscientiously whatever is ordered, and not alter a prescription in the least, unless the limits of safety have been transgressed? Why then should a mixture of drugs ordered in powder form be changed into a pill mass? A capsule is, according to all authorities, a cover for nauseating or strong smelling medicines, no teacher or encyclopedist restricts its meaning to pills alone. A pharmacist, therefore, has no right to suppose that a physician wishes to order a pill mass when he orders powders, especially as the prescriber has it in his power to add the words "fiat massa," and thereby express such desire if it existed. Where, however, such a remark is wanting, there is no reason why a mass should be formed. Powders, not pills are ordered to be put into capsules, and the pharmacist who changes the powders into a mass doubtlessly transgresses the limits of his professional liberties. And what other motive to do so can there exist, but the desire to save time and labor? The tendency of late years to prepare prescriptions at lower prices than all the competitors and sacrifice everything to cheapness, has reduced not only the time allotted to each prescription, but also the care and solicitude so necessary in the fulfillment of our professional duties. It is easier to make a mass and cut it into so many parts than to carefully weigh each powder, and let the accuracy with which the last powder balances the calculated weight serve as a proof of the correctness of all powders.

It is claimed that in many instances the bulk of the dry powder would necessitate a very large capsule, while a mass could be compressed to a much smaller volume. In answer to this argument we must not forget that it is not the pharmacist's province to regulate the bulk of the medicine, or to correct a physician, as long as the dose is within the limits of safety. If a physician chooses to order a mixture containing as a dose one-sixtieth grain of strychnine dissolved in a tablespoonful of some aromatic liquid, no pharmacist would consider it his duty to change the tablespoon to a teaspoon, and thereby reduce the bulk of this medicine to one-fourth of the prescription under the plea that the bulk of the dose was too large. If, therefore, the physician orders a powder to be put into capsules and the largest capsules alone will hold the prescribed dose, there is no reason why the pharmacist should change the order. Nor is it always true that a mass will reduce the bulk. In the first place it is always necessary to add some excipient, if it be only water, thereby adding to the weight; very often adhesive vehicles as gum acacia, tragacanth, various mucilages or glycerites are needed to form the mass. The danger of adding a little too much of a liquid vehicle, and then being compelled to correct the mistake by adding some solid, often increases considerably the bulk of the mass without adding to its medicinal properties. Furthermore, while all these ingredients may be perfectly harmless, if considered by themselves, they may yet change the finely comminuted powder to a hard lump, which instead of being easily assimilated by the patient would pass undissolved through the system or even be the cause of serious digestive disorders. Lastly, we may also state that although there are people who prefer small capsules to large ones, there are just as many who will take a large capsule as readily as a small one.

A few words may be added about the filling of capsules, which seems to be a difficult task to some pharmacists. Whenever a mass is first prepared, little difficulty is experienced. The general procedure is to roll the mass and cut it into the required number of pieces, in such a way that each piece has the shape of a small cylinder, of a diameter a little smaller than that of the body of the selected capsule. The operator should then wash his hands, in order to remove all traces of the mass, and then introduce the small cylinders into the capsules by means of a needle with which he picks them up. As especially fit for this work, I mention the small botanical needles used in dissecting flowers, which are provided with a wooden handle, an instrument that every pharmacist can prepare himself. The covers are afterwards put on with the fingers. By this method, the odor as well as the taste of the ingredients of the mass are thoroughly covered by the capsule. Care should be taken not to select too large a capsule, so that the mass after drying will fill only half the space; but even with the greatest care in preparing the mass a shrinking will afterwards take place, an inconvenience which it seems impossible to overcome.

During the last year, I have given this method of filling capsules my special attention and compared repeatedly the cylindrical parts of the mass by weighing them. In very rare instances have I found two parts that weighed exactly the same, the variation in my own work ranging from a fraction of 1 percent to 3 percent, in spite of the greatest care exercised. Experiments with masses cut by other operators showed a similar, sometimes worse, result: I have discovered two apparently equal pieces of the same mass to vary as much as 8 percent. In most instances this lack of exactness seems to be irrelevant, but we must admit that if we once allow a variation it is hard to draw a limit. I have therefore adopted a better and more correct method, and during the last six months, instructed my assistants to weigh the mass, divide the weight by the number of capsules ordered, and then weigh each part seperately before putting it into the capsule. Objection might be raised that this is a troublesome and tedious procedure. But this is not so. By using the metric weight a division is quickly made, and the weighing of from 12 to 20 small parts requires no longer time than the rolling and cutting.

To introduce powders into the capsules is not quite so simple, and requires a small apparatus to insure correct results. Some pharmacists resort to the rather crude method of putting the powder, without dividing it, on a piece of paper, taking the body of the empty capsule between the fingers in the left hand and the cover in the right, and fill both by shoving them through the powder repeatedly. This method which is even recommended in one of the newer works on pharmacy as the best means of filling capsules is objectionable in more than one respect. In the first place it is impossible to gauge the quantity of the powder that is thus introduced into the capsule, and repeated weighing of each capsule becomes necessary, until the correct weight is reached, sometimes after many trials. Secondly, the very object of the capsule is entirely ignored; particles of the mass will adhere to the outside, and neither taste nor odor of nauseating medicines can afterwards be entirely removed. A capsule filled with quinine in this manner will taste bitter no matter how often it is wiped after filling, and if the mass should contain such strong ingredients as asafetida or valerian, their odor can never be removed. The proper way, insuring correctness and elegance, is to weigh each powder separately, and introduce it into the empty capsule by means of a small apparatus, of which various kinds are in the market. There is Reymond's capsule filler, consisting of a block of wood with a number of sockets for the empty capsule, and a second block with a corresponding number of funnel-shaped receptacles; another instrument, the Davenport capsule filler, consists of a metal funnel for the capsule and a plunger. Both these and other apparatus have their advantages and drawbacks.

I have here an instrument which I think is an improvement on the others. It consists of a base (Fig. 2), with a number of small plugs, and a block (Fig. 1), with a corresponding number of holes into which the plugs fit; these holes are widened at the upper side into small funnels. At the sides are pegs as guides for the upper block, so that each hole will be exactly over each plug. In the center of the baseboard there is a metal rod with a thread for a screw-nut at the upper end; the nut for this thread is held on the upper side of the perforated block by an overlapping flange, and can be turned easily by means of a pair of wings. A short plunger (Fig. 3), concave at one end and convex at the other completes the apparatus.

The modus operandi explains itself. The two blocks are arranged so as to place the upper one over the lower one, the empty capsules are introduced and pushed by means of the plunger into the perforation until they touch the plugs; if necessary the upper block is lowered by means of the screw until the upper parts of the capsules are even with the funnel-shaped widening of the perforations; the powders, each one having been weighed, are put into the funnels and pressed down with the concave end of the plunger, leaving a small elevation over each capsule for the hollow of the cover. By a few turns of the nut the capsules are now partially raised out of their casings, high enough to put the covers on, these latter might be moistened inside with a trace of water by means of a camel's hair pencil, and thereby glued on. After the covers are put on, a few additional turns of the screw will raise the capsules entirely out of the casings.

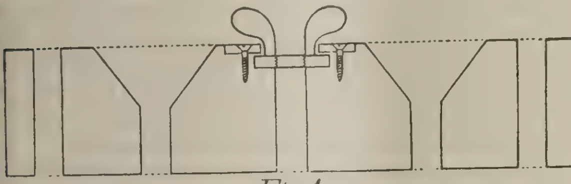

Fig 1

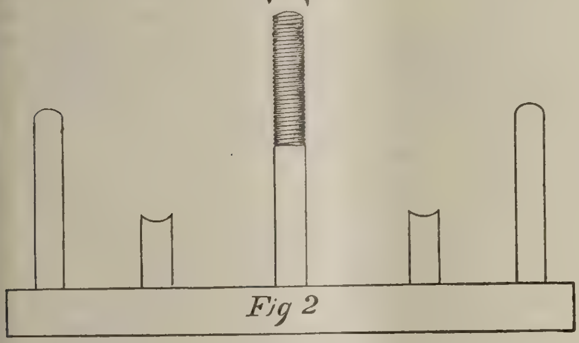

Fig 2

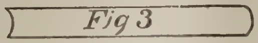

Fig 3

As a resumé I would submit the following rules:

1. Always follow the physician's directions as to the formation of a mass.

2. If no directions are given, form a pill mass whenever the ingredients cannot be mixed in powder form. Weigh the same, divide the weight by the number of capsules ordered, weigh each part and give it the shape of a small cylinder by rolling it between the thumb and first finger. Wash the fingers and introduce the cylinders into the capsules by means of a needle.

3. If no directions are given, and the ingredients of the prescription will form a powder, divide their combined weight by the number of capsules ordered, weigh each powder separately and introduce it in powder-form into the capsule by means of a convenient apparatus. Under no condition should the undivided powder be forced into the capsules, by moving the bodies and covers through the powder from opposite directions.

Physiology and Therapy.

Excretion of Ammonia in Disease.

In a number of cases of infective disease (pneumonia, typhoid, influenza, cholera etc.) the amount of ammonia excreted in the urine, as such, is increased. According to T. Rumpf the normal amount of nitrogen in the form of ammonia in the 24 hour's urine is given as varying from 0.4 to 1 gram. In the cases of disease examined, it varied from 0.8 to 6 grams. This condition passes off in an early stage of convalescence. The total nitrogen excreted is not similarly increased. On the average, there is an increase of 37 percent in the proportion of ammoniacal nitrogen to total nitrogen. The increase cannot be attributed to change of diet, but is explained as the result of the activity of miro-organisms. In cultures, addition of the bacilli of cholera and of other diseases causes a formation of ammonia.

E. Halleroorden, however, differs from Rumpf as to the conclusions drawn by the latter. He claims that the ammonia produced by bacteria would be converted into urea. Ammonia has, above all, in the body the function of an acid neutralizer; this is entirely neglected by Rumpf, who gives no estimation of acidity. The cause of the apparent increase of ammonia is doubtless to be sought in the alteration of the amount of acids produced by the fever.

[J. C. S., 70^{II}, p. 379; from Virchow's Archiv, 143, pp. 1 and 705.]

Anti-Vaccinationism.

The centenary of Jenner's demonstration of the utility of vaccination as a preventive of smallpox has been celebrated or neglected with more or less enthusiasm in various parts of the world. On the whole, it has received less attention from the profession and the public than the great importance of the subject and the high character and devoted services of the man have deserved. Co-incidentally the outbreak of an epidemic of smallpox at Gloucester, England, but sixteen miles from Berkeley where Jenner made his discovery, has exhibited on a regrettably large scale, the folly of the anti-vaccinationists. They are, or rather were, in great numbers in that town; but the disease spread so rapidly and was so fatal that most of those left alive were convinced by circumstances and have been vaccinated. We have not at this writing exact data at hand, so that we hesitate to state the number of lives that were meanwhile sacrified; but it was very large.

We confess to much sympathy with the good old British doctrine of the "liberty of the subject." There is no doubt that the modern tendency, as well in England as in America, is too much toward the imitation of European and Asiatic methods of paternal government. Unable to realize that a healthy social organism, like a healthy man, is in no need of medicine, our lawmakers devise one nostrum after another to improve the social welfare; and attribute the inevitably bad results of their interference to any cause but the true one. But in the matter of resistance to laws making vaccination compulsory, our English cousins are stretching a good doctrine too far. Vaccination is not for the protection of the individual only, but of his neighbors as well. If any one chooses to run the risk of sickening or dying with smallpox, he has an undoubted right so to do, so far as his mere personal welfare is concerned; but he has no right to expose his neighbors to the danger of being infected through him.

Accepting, therefore, as the standard of just government, its conformity with the law of "equal freedom," namely that "every one has the right to do as he wills, provided he infringe not the equal right of every other" — from which it follows that the sole function of government is to prevent one from infringing the equal right of another — we see that not compulsory vaccination but refusal to be vaccinated is a violation of justice. For refusal of vaccination by one impairs the ability of all others to protect themselves against the danger to life involved in the introduction and spread of pestilence. Under these circumstances the "liberty of the subject" is not invaded by compelling him to be vaccinated, and to have his children similarly protected.

Thyroid Preparations and Therapy.

The May number of the Therapeutische Monatshefte contain abstracts of the following articles on this subject:

1. Ueber jodhaltige Organismen und deren arzneiliche Anwendung. Von Prof. Erich Harnak in Halle. (Muench. med. Wochenschrift. 1896, No. 9.)
2. Ueber das normale Vorkommen des Jods im Thierkörper. (II. Mittheilung.) Von E. Baumann und E. Roos. (Zeitsch. f. physiol. Chem., Bd. 21, H. 5 u. 6.)
3. Ueber das Thyrojodin. Nach einem am 28. Febr. 1896 im Verein der Freiburger Aerzte gehaltenen Vortrage. Von E. Baumann. (Muench. med. Wochenschrift. 1896, No. 14.)
4. Beitrag zur Wirkung des Thyrojodin auf den Stoffwechsel bei Fettsucht. Von Dr. E. Grawitz. (Muench. med. Wochenschr. 1896, No. 14.)
5. Ueber Thyrojodin. Vorläufige Mittheilung von Dr. A. Hennig. (Muench. med. Wochenschrift. 1896, No. 14.)
6. Experimentelle Untersuchungen über die Bedeutung der Schilddrüse und ihrer Nebendrüsen auf den Organismus. Von Dr. S. Blumreich und Dr. M. Jacoby. (Berl. klin. Wochenschr. 1896, No. 15.)
7. Ueber die Behandlung des Kropfes mit Schilddrüsensaft. Von Prof. Dr. O. Angerer. (Muench. med. Wochenschr. 1896, No. 4.)

This list of articles clearly demonstrates the interest which this chapter of glandular therapy is at present enjoying. It is impossible to reproduce abstracts of all of these articles here. The brief historic sketch given by Prof. Harnack, however, may not be out of place.

Older medicine had many years before the discovery of iodine made a purely empiric use of marine plants and animals containing iodine in the treatment of glandular diseases: scrophula etc. Of fresh water organisms only few, such as *spongia fluviatilis*, approximate the marine organisms in percentage of iodine. Consequently these were used but little medicinally.

The first and oldest iodiferous drug is the charred sponge, *Spongia marina usta*, or more correctly *Spongia tosta*, prepared from the ordinary bath sponge. According to some authorities the crude bath sponge contains about 2 p.c. iodine. The fact that completely incinerated sponges contain less iodine than the charred sponge seems to indicate that the iodine is in organic combination. If the iodine in organic combination is more effective than the metallic iodide then this fact would be in harmony with the experiences of thyroid therapy.

Of other scrofula remedies of animal origin there might be mentioned: corrals, oyster shells and herring brine, cod liver oil and even pigeon dung, fat of snakes, the ash of the mole and the umbilical cord.

As to iodiferous remedies of vegetable origin the algæ should first be mentioned: *Fucus filum* and *vesiculosus*, *Sphærococcus confervoides*, the mixture known as worm moss or *thelminthocorton*, formerly used in Italy, the calcined *Laminaria saccharina* and *digitata*, used in India.

Of terrestrial origin tobacco ash was used formerly in struma and scrophula. Tobacco smoke is also said to contain iodine. Older medicine recommends a number of plants against scrofula: *Folia* and *Semen perfoliatæ arvensis*, *Folia rutæ murariæ*, *Fol. Senecii*, *Fol. vermiculani* or *Sedum minimum*, *Umbilicus Veneris*, *Radix Bardanæ minor*, *Radix Scrophulariæ*, etc. It would be of interest to ascertain whether these plants contain more iodine than other closely related ones.

The entire history of the application of iodiferous remedies is one of the most interesting in the history of medicine. Iodine in animal organisms was used therapeutically as many as 600 years ago, to-day medicine is coming back to its old practice. Formerly the iodine of lower organisms was taken, to-day that of highly organized ones is employed.

[Therap. Monatsh., 10, p. 280.]

Literary.

Books and Pamphlets Received.

Deutsche Verlags Anstalt — Stuttgart. Lexikon der gesammten Technik und ihrer Hilfswissenschaften. Herausgegeben von Dr. Otto Lueger im Verein mit Fachgenossen. Mit zahlreichen Illustrationen.

XIV. Abtheilung: Dunst — Eisenwolframlegirung. pp. 481—640. 1896. M. 5.00.

XV. Abtheilung (Schluss des dritten Bandes): Eiserne Brücken — Essigmutter. pp. 641—800. 1896. M. 5.00.

B. G. Teubner — Leipzig. Exkursionsflora für Nord- und Mitteldeutchland. Ein Taschenbuch zum Bestimmen der im Gebiete einheimischen und häufiger kultivirten Gefässpflanzen für Schüler und Laien. Von Prof. Dr. Karl Kraepelin, Direktor des Naturhistor. Museums in Hamburg. Vierte umgeänderte Auflage. Ein Bd., pp. XXVIII, 338. Mit über 500 in den Text gedruckten Holzschnitten. 1896. M. 3.80 geb.

—— Die verbreitesten Pflanzen Deutschlands. Ein Uebungsbuch für den naturwissenschaftlichen Unterricht. Von Prof. Dr. Otto Wuensche, Oberlehrer am Gymnasium zu Zwickau. Zweite Auflage. Ein Bd., pp. 272. 1896. M. 2.40 geb.

—— Die verbreitesten Pilze Deutschlands. Eine Anleitung zu ihrer Kenntniss. Von Dr. Otto Wuensche. Ein Bd., pp. XII, 112. 1896. M. 1.40 geb.

Friedrich Vieweg und Sohn — Braunschweig. Friedrich Mohr's Lehrbuch der chemisch-analytischen Titrirmethode. Von Dr. Alexander Classen, Prof. d. Chem. an d. Königl. technischen Hochschule, Aachen. Siebente umgearbeitete und vermehrte Auflage. Ein Bd., pp. XVIII, 906. Mit 191 eingedruckten Holzschnitten. 1896. M. 35.00.

Gebrüder Bornträger — Berlin, S. W. Zeitschrift für angewandte Mikroskopie. Mit besonderer Rücksicht auf die mikroskopischen Untersuchungen von Nahrungs- und Genussmitteln, technischen Produkten, Krankheitsstoffen etc. Erster Band. Herausgegeben von G. Marpmann. Ein Bd., pp. 390, sowie Lexikon der angewandten Mikroskopie. pp. 1—48.

Authors — On the toxic action of dissolved salts and their electrolytic dissociation. By Dr. Louis Kahlenberg and Dr. Rodney H. True, School of Pharmacy, University of Wisconsin. Reprinted from the Journ. of the Am. Med. Assn. Pamphlet, pp. 12. 1896.

Authors — Beitrag zur Kenntniss der aetherischen Oele. Ueber Palmarosaoel. Von Eduard Gildemeister und Karl Stephan. Besonderer Abdruck a. d. Archiv d. Pharmacie. Pamphlet, pp. 10.

U. S. Department of Agriculture — Washington. Crimson clover hair balls. By Fr. V. Coville, Botanist. Circular No. 8, Division of Botany. Leaflet, pp. 4.

Author — Silber und Silbersalze als Antiseptica in chirurgischer und bacteriologischer Beziehung. Vortrag von Dr. B. Credé. Pamphlet, pp. 8.

Author — 1.) Die Verwendung des Tannigen bei Diarrhoen der Kinder. Von Prof. Dr. Escherrich.

2.) Zur Anwendung des Tannigen bei chronischen Diarrhoen von Erwachsenen und Kindern. Von Prof. Dr. Biedert. Separat-Abdruck a. d. Therap. Wochenschr. Leaflet, pp. 4.

Author.—On the chemical composition of bismuth subnitrate. By Lyman F. Kebler. Reprint from Am. Journ. of Pharm. Fascicle, pp. 4.

Reviews.

Lexikon der gesammten Technik und ihrer Hilfswissenschaften. Im Verein mit Fachgenossen herausgegeben von Dr. Otto Lueger. Dritter Band. Caciumoxyd bis Essigmutter. Mit zahlreichen Abbildungen. Deutsche Verlags-Anstalt — Stuttgart.

Although it is not everybody's business to be an engineer, yet the achievements of modern engineering are of interest to almost every one. A full appreciation of these achievements is not possible by reading newspaper accounts or even by seeing some of the modern wonders, which are no longer numbered. A good technical encyclopedia is to-day as necessary as a good atlas in a well equipped library.

The excellent work, of which the third volume has just been completed, is what it purports to be, a technical encyclopedia. Yet as its title indicates, the editor in chief, a civil engineer, takes no narrow view of the field covered by the German word "Technik." A brief classified enumeration of some of the larger articles will amply demonstrate this statement. Of general technical interest the following may be mentioned, many of which are well illustrated: Chronometer, Dachstuhl, Damm, Dampf to Dampfpflug, Decken, Deich, Dock, Draht to Drahtzugschranken, Drehbank, Druck, Dynamometer, Edelsteinschleiferei, Eisenbahn etc. Eiserne Brücken, Entstaubungsanlagen.

Architecture is represented by illustrated articles on chinesischer Baustil, Chor, Dorische Bauweise, Elisabethstil, Erker; Geology by the articles Erde, Erosion, Erz etc.; mining by illustrated articles on Deutsches Tunnelbausystem, Eiserner Grubenausbau, Elektricität im Bergbau, Englisches Tunnelbausystem.

Under physics attention should be called to the articles on Camera lucida and obscura, Dehnung, Deklinator, Dichtigkeit (with a table of specific gravities) Doppelbrechung, Elektrische Meerinstrumente, Elektricität und Energie; under chemistry to the derivatives of calcium from Calciumoxyd to Calcium sulfite, Chinin, Chlor, Chloral, Chloroform, Eisenverbindungen. Chemical technology is well represented by the articles on Cellulose, Ceresin, Dampfkochapparat, Desintegrator, Destillation, Dextrinfabrikation, Elektrolyse, Eisen, Eisengiesserei. Attention should finally be called to the sanitary articles on Desinfektion, Drainage, Entwässerung des Bodens etc.

It thus becomes apparent that aside from the articles on theoretical and applied mechanics, the mathematics of which will no doubt puzzle many a so-called engineer, the third volume, like the first and second, is replete with articles of interest to the general reader, who desires information on technical subjects. Typography and illustrations are excellent as in the previous volumes. With each new volume the work recommends itself more as one of the standard works of its class.

E. K.

Missouri Botanical Garden. Seventh Annual Report. Published by the Trustees, St. Louis, Mo. 1896. pp. 208, plates 66.

In addition to the report of the administration of the Garden and other matters of interest to one who follows the growth of this institution of unusual import to science in America, the volume in hand presents much of value to botany.

The Director, Dr. William Trelease, contributes a revision of the *Juglandaceae* of the United States. The descriptions, based on the winter characters of the trees drawn from bark, fruit, buds and twigs are of especial interest. The text is illustrated by twelve half-tone plates showing the growth-habit and the appearance of the bark. Leaf scars, buds and fruits are illustrated by thirteen plates made from drawings by Miss Grace E. Johnson.

Dr. A. Isabel Mulford presents a paper on the Agaves of the United States. This, since Engelmann's monograph (1875), is the only one devoted especially to our species and forms a valuable addition since our knowledge of the territory of which this genus forms a characteristic feature, has been much enlarged since that time. An interesting general account of the genus is followed by a chapter on the economic uses of the Agaves. A detailed description of the different forms is given. The article is illustrated by thirty-eight plates of which sixteen are half-tones, the remainder from drawings.

Mr. C. N. Thompson discusses the ligulate Wolffias of the United States in an article which is accompanied by three plates.

In addition to the scientific papers, the Anniversary publications also have place. An address by President Henry Wade Rogers on the Value of a Study of Botany comes under this heading.

The catalogue of the Sturtevant Prelinnean Library, reviewed elsewhere, closes the volume.

Rodney H. True.

Hilfstafeln zur Prüfung chemischer Präparate. Auf Grund der Pharmacopoeia austriaca ed. VII zusammengestellt von Dr. L. J. Panics, königl. serb. Militär Apotheker. Verlag von Josef Lafár, Wein. Ein Bd., pp. IV, 80. 1895. M. 1.80.

This little book, which as a pocket guide is to serve as a constant companion and counselor to the pharmacist, is largely an extract of the Austrian Pharmacopoeia. The chemicals of this pharmacopoeia are enumerated alphabetically and the tests are arranged in tabular form. In addition to the tests of the pharmacopoeia the author has added, wherever necessary, others, more especially among the specific tests for impurities. These are mostly tests which have been collected from the scattered sources of recent literature.

The text is supplemented by a list of reagents and abbreviations. The typography is good and the book leaves on the whole a favorable impression.

E. K.

Practical Methods of Organic Chemistry. By Ludwig Gattermann Ph. D. Translated by Wm. B. Shober Ph. D. McMillan Co. N. Y. One vol., pp. 329. 1896.

This is a book which should be in the library of every teacher of organic chemistry and one which will no doubt be of great value as a guide to students in their second year of organic chemistry. Its chief peculiarity and merit is in the great stress laid on practical laboratory work. The first one-hundred pages are devoted to a presentation of the general operations used in making organic preparations: crystallization, distillation, decolorizing, heating under pressure, etc., and of methods of organic analysis. The analytical methods are described clearly and illustrated by examples, with methods of calculation. The remainder of the book is taken up with experiments and theoretical work based upon them. The greater part of those general methods which lend themselves to laboratory work of a character not too difficult are clearly illustrated. Following each experiment in preparation-making there is a short discussion of the general principle involved and an indication of the scope and usefulness of the method illustrated by the experiment. It is preeminently a worker's guide, not a book for the class-room nor for reference except to gain knowledge of practical details. It is excellent in its place.

H. W. Hillyer.

Exkursionsflora für Nord- und Mitteldeutschland. Ein Taschenbuch zum Bestimmen der im Gebiete einheimischen und häufigen kultivirten Gefässpflanzen für Schüler und Laien. Von Prof. Dr. Karl Kraepelin. Vierte umgeänderte Auflage. Druck und Verlag von B. G. Teubner, Leipzig. 1896. pp. 338, mit über 500 in den Text gedruckten Holzschnitten. M. 3.80.

In this little work we have a book in which everything is subordinated to one end, viz. the identification and labelling of the plant and that by the most expeditious route. Consequently little significance is attached to the general arrangement of the families, modern ideas of a natural order being quite neglected. The descriptions are just sufficient to insure the probable correctness of the diagnosis. Words are saved and clearness increased by the plentiful use of small woodcuts throughout the book, showing contrasting structures. The copious glossary is in a like manner illustrated. Although the plan of the book is hardly such as to greatly illuminate the subject, criticism is somewhat disarm by the author's plain avow of but a single purpose and we are only left to question the wisdom of this purpose. If one desires a pocket volume convenient in size and neat in get-up by means of which the layman or the beginner can readily arrive at the name of a given plant, we are confident he can find none better, for the range to which it applies, than this.

Rodney H. True.

Die verbreitetsten Pflanzen Deutschlands. Ein Uebungsbuch für den naturwissenschaftlichen Unterricht. Von Prof. Dr. Otto Wünsche. Zweite Auflage. Druck und Verlag von B. G. Teubner, Leipzig. 1896. pp. 272. M. 2.40.

In this little book we have brought together, according to a reasonable system of classification (Engler's Syllabus, 1892), descriptions of the most widely distributed phanerogamous plants of Germany. By the free use of keys and by condensed descriptions confusion to the beginner through multiplicity of characteristics, some of them perhaps variable, is avoided and the size of the book kept within convenient limits. The clear type and the flexible linen binding add also to the ready usefulness of the book. Certain plants offering especial difficulty of identification in the body of the book are considered in an additional key in which leaf characteristics are mainly used.

For the use of beginners and for people who care only for the names and general relations of the common plants of Germany, this book must be of service. This is evidenced by the fact that a second edition is demanded within less than three years after a large first edition.

Rodney H. True.

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EDITORIAL.

The International Pharmaceutical Exhibition at Prague.

August 15th to September 15th.

Americans are used to pharmaceutical exhibits on a scale and of a variety which can only be expected and realized in a country where the character and the scope of the retail drug-trade are so unlimited and where pharmaceutical manufacturing industries in all their legitimate branches as well as in their side issues are of such an extent and magnitude—and it may be added, of such a perfection—as in the United States. The continental standard and the authoritative restriction of the apothecary, strictly discriminating between the responsible pharmacist and the far less responsible retail-druggist, confine the practice of pharmacy to its legitimate application and resources, impressing upon the "Apotheke" the stamp of an official scientific institution in the domain of public sanitation. Pharmaceutical exhibitions in continental Europe seem to be in strict conformity with this principle and consequently to apply only to legitimate objects of the traditional "Apotheke". They do not aim to offer that vast and almost unlimited variety of products and of all kinds of goods and commercial commodities which make up the wondrous stock of the American drug-store and which are offered for sale and dispensed in the unique variety-shop of the average American retail-druggist.

Yet to this rule the present pharmaceutical exhibition at Prague makes a progressive exception, inasmuch as it, in the variety and the character of many of its exhibits, much more approaches the American prototype, including for instance wines, liquors, perfumes, soaps, proprietaries, surgical appliances, etc. But it surpasses this by far in the more scientific and historical character of several large groups of exhibits. It may therefore be justly stated that the so-called Second International Pharmaceutical Exhibition at Prague by its magnitude, by the great mass and variety of exhibits and by its most tasteful arrangement in the magnificent structure in the Ausstellungs-Park in Prague, is a great credit to its originators, its exhibitors and to the aims, the accomplishments and the enterprise of Austrian pharmacy and its pharmaceutical and collateral industries.

The Allgemeine Oesterreichische Apotheker-Verein inaugurated the first so-called International Pharmaceutical Exhibition in 1883 in Vienna. This venture proved a satisfactory success. The Pharmaceutical Society of Prague concluded last year to signalize the commemoration of its 25th anniversary by the arrangement of a second equally comprehensive pharmaceutical exhibition in Prague in the fall of 1896. This project met with general approval throughout the province of Bohemia and the Austrian Empire. The society was fortunate enough to secure for the exhibition the magnificent Industrial Palace erected some years ago in one of the beautiful public parks of the historical and wealthy grand capital of Bohemia, in the *Král Obova* at Prague. The Executive Committee, consisting of pharmacists, scientists, physicians, university-professors and citizens of Prague, has succeeded in realizing within a comparatively brief time a large, comprehensive and in several respects most valuable, instructive and unique exhibition—unique particularly in its collections of historical literature and documents and rare treasures of old handiwork and implements relating to pharmacy and medicine, hidden away for centuries in the vaults and libraries of monasteries and mediæval castles. Another unique but modern and appropriate feature of the display was the comprehensive representation of hygiene and bacteriology in their manifold direct and indirect applications to medicine, surgery and public and personal sanitation.

The exhibition in Prague differed, moreover, in several respects considerably from the pharmaceutical shows as we are used to see them at the occasion of the annual meetings of the American Pharmaceutical Association. It is equally comprehensively stocked with the customary outfit of a prescription-pharmacy with all its appliances and requisites, of the pharmaceutical, the analytical, the bacteriological laboratory; it contains a vast assay of the crude drugs, of galenicals and other pharmaceutical preparations and of chemical products of every description used or sold in pharmacies and the drug trade. Fluid extracts, coated pills, tablets, all kinds and forms of plasters, ointments and surgical dressings are represented in great numbers and variety and to perfection. In this respect the exhibition at Prague indicates considerable progress in continental manufacturing pharmacy aiming at that degree of perfection and reliability long since attained by the much grander manufacturing industry of the United States.

The exhibition at Prague, however, far surpasses our customary American displays in the prevalence of literary and historical exhibits of great value and interest. The museums, libraries and vaults of the castles, monasteries and of the old guilds of Prague and Bohemia, some with a historical record of nearly a thousand years, seem to hide a vast array of literary and art antiquities, of all kinds of implements, and of manuscripts and documents of every description relating to the art of healing in all stages of its slow evolution. Many of these documents seem almost unknown to the present generation and surely form a most valuable array of sources for the student of the history of medicine and pharmacy. From this large und unique collection of historical documents, displayed under the bright roof of the Exhibition Palace at Prague, but a few of the exhibitors may be mentioned in order to indicate where these historical treasures may be found scattered far beyond the realms of pharmacy: The Archives and National Museums of Prague; the Prince-Archbishop of Bohemia; the Prince of Schwarzenberg at Wittingau; the Prince of Lobkowitz; the Monastery of the Benedictine monks at St. Margareth; the Convent of the Præmonstratence Brotherhood at Strahov; the Convent of the Benedictines at Lettowitz in Moravia; the Convent of the Brothers of Mercy at Prague; and various libraries and museums of state, municipal or private institutions in Bohemia and adjoining provinces.

This historical part of the exhibition at Prague includes, besides literary documents, manuscripts, medals, apparatus, instruments and all sorts of appliances and utensils from mediæval to more recent times, whole prescription-pharmacies and pharmaceutical and alchemistic workshops as represented in Dr. Hermann Peters' well-known Pictorial History of Pharmacy. Next to the great collection in the Germanic National Museum at Nuremberg, the present exhibition at Prague may have offered one of the most comprehensive and unique exhibits of rare historical documents ever presented to the student of the history of pharmacy.

Another novel feature of a pharmaceutical exhibition was the creation of a botanical garden on a small scale on the grounds of the beautiful park, in front of the Exhibition Palace. A large number of officinal plants, grouped as much as possible in their natural orders, had been planted early in spring and under proper care had developed very well. The collection is quite representative and instructive and well supplements the great array of herbaria and botanical illustrations and the extensive pharmacognostical exhibits from the museums of the Allgemeiner Oesterreichischer Apotheker-Verein at Vienna and of the Pharmaceutical Society of Prague, exhibited inside the building.

Without entering upon any description of details, the scope and the character of the Pharmaceutical Exhibition at Prague may be recognized by enumerating the main groups in which the objects of the entire exhibition have been arranged in the official catalogue, issued in two languages, the German and the Bohemian.

Group 1. Scientific apparatus, applied in pharmacy and its practice.
" 2. Pharmaceutical literature.
" 3. Machines, appliances, apparatus etc., applied in pharmacy and pharmaceutical manufacturing industries.
" 4. Complete outfits of pharmacies and store-rooms.
" 5. Drugs, pharmaceutical preparations and chemical products of every description as pertaining to pharmacy.
" 6. Literature, documents, apparatus, appliances, implements, works of art etc., illustrating the historical evolution of pharmacy.

Group 7. Special exhibits of pharmaceutical corporations and societies.

" 8. Hygiene and the care of the sick.
  - a. Domestic hygiene, water-supply, ventilation, bathing, illumination.
  - b. Personal hygiene. clothing, nutrition, foods and drinks, cosmetics perfumes.
  - c. First help in emergencies, hospitals, army and navy, industrial hygiene.
  - d. Public instruction in hygiene, school-hygiene, gymnastics, disinfection, bacteriological and microscopic preparations for demonstration.
  - e. Balneotherapy, mineral springs, watering places, climatic sanitaria.

The total number of exhibitors, including those whose applications for space were too late to permit their names to be mentioned in the official catalogue, was about 568. These were distributed among the groups as follows: In group 1 — 18 exhibitors; in group 2 — 90 exhibitors; in group 3 — 18 exhibitors; in group 4 — 53 exhibitors; in group 5 — 102 exhibitors; in group 6 — 60 exhibitors; in group 7 — 8 exhibitors and in group 8 — 221 exhibitors.

The United States were represented by but one exhibitor from St. Louis iu group 2, and England by 5 exhibitors in the same group.

This brief outline may suffice to give some idea of the scope and the character of the Second International Pharmaceutical Exhibition at Prague. Its arrangement was the more a tasteful and systematic one as the grand Exhibition Palace offers a vast amount of space and excellent light. Therefore both the exhibition as a whole and the various groups with all their individual exhibits made a most favorable impression. If there was any drawback worth mentioning it was the far too general use of the Bohemian language for inscriptions and descriptive signatures. This ill-applied show of sectionalism was certainly a considerable detriment to the full appreciation of the grand exhibition and was justly deplored and criticised by all visitors from outside of Bohemia.

The term "International" has as yet not met with any good luck in anything pharmaceutical. In congresses and in all efforts to create an "International Pharmacopœia" it has proved a misnomer from the early congresses at Brunswick and St. Petersburg to the recent farce at Chicago in 1893. The so-called International Pharmaceutical Exhibitions in 1883 and in 1896 have been no exception to this experience. Both have been fair and successful representative displays of the status and the advance of pharmacy, both in their respective countries and in general, and both have been a great credit to their organizers and patrons, and in particular to pharmacy and the pharmacists of the glorious Austrian Empire.

Fr. H.

The Rule of Thumb in State-Board Examinations.

At the Montreal meeting of the American Pharmaceutical Association the greater portion of an afternoon was given to the discussion of state-boards and state-board examinations. It was a spirited session and, no doubt, many of those present derived some benefit from the ventilation of opinions if not from the personalities indulged in by some. Whereas numerous matters of detail were discussed at length, some of the more general as well as most important features were left almost if not wholly untouched.

The following abstract from a recent editorial in the Nation may serve as a parallel illustration and at the same time as an introduction to what the writer has to say with regard to the rule of thumb in the official pharmaceutical examinations as conducted in this country. There are exceptions, but these exceptions merely go to proove the rule.

> "The Society of the Army of the Tennessee determined last year to erect an equestrian monument to Gen. Sherman, and a committee was appointed for the purpose. Conscious, apparently, of their own want of skill and experience in the matter of judging sculpture, they very properly asked four leading sculptors and a prominent architect to aid them in making a selection among the designs for which they had advertised. In this they followed the admirable example of Mr. Burnham at Chicago. He summoned the leading American artists, and asked them to make designs of exhibition buildings and divide the work among themselves. The world knows the result. In other words, he acknowledged that the men who give attention to a thing, and win fame in doing it, especially in matters of taste, are most likely to be right in their judgment about it.
>
> "We have said in 'matters of taste,' but this is really true in all matters. Civilization is built on, and progresses on, the idea that men who occupy themselves with any pursuit are likely to know more about it than those who do not, and that their advice touching that pursuit is good to take. This is true of war, of literature, of science, and of art in all its branches, of small things as well as great, from arranging a dinner table to fighting a battle.
>
> "The five artists thus selected promptly complied with the request of the committee, and went to Washington, where they passed judgment on the designs there collected, selected two as of more merit than the others, and recommended that further competition between the authors of these two should be ordered. They acted without compensation, for the honor of Gen. Sherman and the credit of American sculpture. This advice was given, they say, 'in the clearest way, and

with every precaution to guard against misunderstanding.' Far from taking it, the committee promptly proceeded to call for further competition between, it is true, the two recommended by the judges, but also between two others, one of whom had already been specially disapproved, or not at all approved, by the judges. Worse than all, when the award was finally made, it was made, without communication with the judges, to that one of the two supplementary competitors whose model in the first competition was not considered by the committee of experts as worthy of consideration."

American druggists sometimes find themselves in the position of the war veterans. Complaint has been made by members of the Am. Pharm. Ass'n. and of other pharmaceutical associations that the pharmaceutical professor is altogether too deeply interested in his scientific pursuits and takes too little interest in the every-day well-being of the pharmacist.

There are two kinds of pharmaceutical professors: first, those who know everything and can even give "tips on advertising," "how the druggist should treat his customers" etc.; secondly, those who simply prefer to be teachers and investigators, but would on the whole leave business matters to those who are competent and successful business men.

Nevertheless American druggists have sometimes had occasion to ask the assistance of the second class. Educational institutions have now and then been founded upon consultation with and even with the assistance of such men. They have been placed in charge of educational institutions and have used their best judgment in the arrangement of courses of study. Yet the very class of men that has called upon such persons for counsel, has been ready to hastily denounce the plans proposed or carried into effect by those who had not appointed themselves, but who had been called because they were considered competent to fill the positions to which they were elected.

The university or college professor is as a rule elected to his position because he is supposed to possess at least some capacity as a teacher. This implies that he is likewise supposed to be able to conduct an examination. Yet a university or college professor as a member of a state-board of examiners is a very rare bird. Indeed, if a person dares to suggest, as the writer did,* that examinations in chemistry should be conducted by a teacher of chemistry, those in botany and pharmacognosy by teachers of the respective sciences, and that the examinations of a more practical nature should be conducted by experienced practicing pharmacists, he is pointed to as a most dangerous heretic. What were to become of our beloved pharmacy if university or college professors were to conduct a part of the state-board examinations. These men, evidently, are to be considered as the worst enemies of pharmacy and are not to be entrusted with duties for which their lifework eminently fits them.

The Am. Pharm. Ass'n. yearly sends lists of queries to its members, including the college professor. The query as to how state-board examinations can best be conducted occurs again and again. If the college professor replies to such queries, his expression of opinion, therefore, cannot be considered uncalled for.

At present most of the members of state-boards are appointed by the governor, names for such appointment being submitted to him by the state association. If in each state a list of names of those who have been nominated by their state association were prepared, and an investigation could be made how many of these had been elected because they were considered especially competent to conduct examinations, the percentage, no doubt, would be almost ridiculously small in most states. It would appear that fitness to conduct examinations, possibly the principal duty of state-boards, received little if any consideration in the minds of the voters. A person may be a "nice fellow," or even a good and successful druggist, but this is no reason why he should be elected to conduct examinations.

If it were possible to get an honest answer from governors why they selected the person of their choice, it would no doubt be revealed that their motives were largely of a political character. Indeed, this has so generally been construed as a fundamental axiom by druggists that a democratic nominee has no expectation of being appointed by a republican governor and vice versa. In fact, druggists as a class rest under the fatalistic belief that the appointment of members of the board is so largely a matter of machine politics both in the association and by the governor "that there is no use in trying to do anything."

In this country everybody is supposed to know not only his own, but everybody else's business, everybody except the college professor. He is not only frequently criticized for what he teaches, but in some states at least he cannot even be elected for nomination by the state association unless he is at the same time a practicing pharmacist. It is true this rule has been violated, but as far as the writer is aware, not in favor of the college professor.

A reaction, however, is setting in. In politics civil service reform has made considerable headway in recent years, even in positions that were created and construed by machine legislators to be of a confidential nature and therefore not open to competitive examinations.

For three generations pharmaceutical education has rested largely in the hands of business men. No one questions their work as pioneers. The institutions founded by them are now seeking affiliation with broader educational institutions. The affiliation by name only, which some of them seek at present, will not suffice; they must become related as to educational methods and in spirit as well before any other gain than that of advertisement can be had. A quiet revolution to this effect is now in progress and by the time the oldest college can celebrate its hundreth anniversary, the union of pharmaceutical education with that of the universities bids well nigh to be complete.

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* [p. 9.]

This will do away to no small extent with petty, rivalry and the university professor, who in many instances is already an officer of the state, will no longer be eyed with that suspicion which now creeps out when the appointment of such men on state examining boards is suggested. His independent position will enable him to use his best judgment for the benefit of the people and of pharmacy in the state in which he lives. The criticism that the university professor is apt to be "ultra theoretical" and therefore not a fit person for state-board examinations need not be discussed at present.

With good reason we look to older European countries for advice in many matters, particularly those of an educational nature. Whether we look to France, to England, or Germany, we will find that in the appointment of examiners the state as a rule selects those men to conduct examinations, who by virtue of their training and position are considered best prepared for such work, and in all of these countries the pharmaceutical teacher occupies a prominent position on the examining boards.

Not a few Americans are like the Chicago preacher who gave the lie to an European critic, who, at the time of the World's Fair, had ventured to publish the statement that only a small percentage of the streets of that city are paved. When the critic furnished figures from municipal reports, he was informed that he was wrong nevertheless, because it was necessary to consider that Chicago was a young and rapidly growing city.

Why not frankly admit that in the rapid growth from barbarism to civilization our institutions have not been born perfect but are in a process of youthful development. No one will be so foolish as to demand that radical changes be made to-day or even to-morrow. American pharmacy is to-day largely what American pharmacists themselves have made it. Possibly at no time in the future will the rank and file of our calling do so much for the development of our profession as they have done during the past twenty-five years. If we are not to come to a stand-still or even to retrograde, the practicing pharmacist must be alive to every interest pertaining to our calling. If pharmaceutical examinations are to mean more in the future than they do to-day it will be of but little avail to discuss a host of minor details as long as there is something fundamentally wrong in the system. A calling is honored so far and only so far by the public as it takes part in its internal improvements and makes the interests of the public identical with its own. *E. K.*

ORIGINAL CONTRIBUTIONS.

Quantitative Estimation of Phenols in Volatile Oils.

Thymol and Carvacrol.

By *Edward Kremers* and *Oswald Schreiner.*

(Report of Research Committee G, U. S. P. Revision.)

Of the large number of volatile oils containing phenols but a few have been subjected to examination for the purpose of quantitative estimation. As the value of these oils often depends very largely if not almost entirely upon the phenol they contain, it is evidently of the utmost importance to the purchaser to know the amount of the phenol present. This was early recognized by dealers in volatile oils, yet a satisfactory method for estimation has been wanting. The first difficulty experienced lies in the weak chemical properties of the phenols themselves. They are mostly liquid, and crystalline derivatives are not always readily to be obtained from them, especially not in the presence of the other oily constituents. A few years ago a method for the estimation of thymol in oil of thyme was put forward. It consists in shaking a known volume of the oil to be estimated with a five or ten percent caustic potash solution; the volume of the oil that is dissolved by the alkaline solution gives the percentage of phenol present. It was soon noticed that the results varied with the strenght of the alkaline solution, as well as with the quantity of solution with which the oil was agitated. Furthermore, when such an alkaline solution of the phenol is diluted with water, a lower percentage of the phenol is always found. These facts clearly show that the alkaline solution removes also other constituents of the oil. An old resinified oil, for instance, will give up much if not all its resinous constituents to the potash solution, and the oil will therefore show a much higher phenol content. From these considerations it is evident that this solution method gives only a rough approximation and is only of value for comparative tests. Nevertheless, the method has been used and it certainly was a step in the right direction as it has at least retarded the pernicious practice of willful adulteration and placed the quality of thyme oil upon a firmer basis.

In attacking this problem of the quantitative estimation of phenols in volatile oils, it seemed best to pay attention, for the present, only to the substitution products. Of these the iodine compounds are the most stable and easily made. Whilst the iodine compounds of some of the phenols are well known and quite readily obtained from the pure phenols, yet it is quite another matter to obtain them from such complex mixtures as volatile oils. The first consideration was to ascertain whether the reaction is strictly a quantitative one. Messinger and Vortmann* found that thymol could be estimated volumetrically with iodine solution. The method consisted in dissolving the thymol in an alkaline solution so that 4 mol. of alkali were present for every mol. of thymol and then adding an excess of 1/10 normal iodine solution. The thymol is precipitated as a dark reddish brown iodide. The excess of iodine added was ascertained by slightly acidifying the solution, making up to a certain volume, filtering off a portion and titrating with 1/10 normal sodium thiosulphate solution. Every mol. of thymol requires four mol. of iodine. It was essentially this method, somewhat modified, that was used in making the experiments cited in the following report.

Estimation of Thymol.

Messinger and Vortmann used 4 mol. of alkali to every mol. of thymol. In working with an oil containing an unknown quantity of thymol this ratio cannot be obtained. The oil under consideration may contain 5 p. c. thymol or it may contain 50 p. c., hence the quantity of alkali to be added is unknown. By experiment it was found that a moderate excess of alkali could be used. Slightly different results were, however, obtained when a dilute solution of alkali was used, the results coming out slightly higher. The method of titration was the same as Messinger and Vortmann's except that an excess of alkali was always employed.

Strength Alkali.	Thymol used.	Thymol found.	Percentage.
5 p. c.	0.1500 gram	0.1504 gram	100.30 p. c.
5 "	0.1500 "	0.1496 "	99.76 "
2 "	0.2000 "	0.2035 "	101.73 "
2 "	0.2000 "	0.2038 "	101.92 "

With the 5 p. c. potassium hydrate solution the results come out very satisfactory and it was this strenght of alkali that was used throughout the following experiments. A large excess of iodine must be avoided as secondary reactions will take place resulting in a compound richer in iodine. How to avoid this, and other details of the method will be described later.

To estimate the thymol in volatile oils a known quantity of the oil was repeatedly shaken with a 5 p. c. potassium hydrate solution until all thymol had been removed. The amount of thymol in the alkaline solution was then determined by titration with iodine solution. In order to compare this method with the solution method before described the volume of oil that remained after shaking out the phenol was always noticed. For this purpose a Mohr burette with glass stopcock, graduated to 1/10 cc., was fitted with a glass stopper at the top, so that the oil could be shaken with the alkaline solution. The oil was diluted with an equal volume of a light boiling fraction of petroleum ether. The advantage is that the alkaline solution is not as likely to dissolve the other constituents. The separation of oil and aqueous solution is also much more rapid and complete. After separation had taken place, the remaining volume of oil could be read off accurately. The alkaline solution was then allowed to run off into a graduated flask and the remaining oil treated with fresh solution. This operation was repeated until all thymol had been removed. By proceeding in this way both methods could be applied to the same quantity of oil at the same time. The method in detail is as follows:

Method for the Estimation of Thymol in Volatile Oils.

From a weighed flask of oil pour out about 5 cc. into a glass stoppered burette graduated to 1/10 cc. Weigh the flask again; the difference gives the weight of oil used for the experiment. Add about an equal volume of petroleum ether and then note the volume of the mixture carefully. A little water can be added so as to bring the oil up to the scale of graduations on the burette. Now add the 5 p. c. potassium hydrate solution and shake vigorously for a short time, then allow to stand until separation is complete. Note the decrease in the volume of the oil and allow the alkaline solution to run into a 100 cc. graduated flask. This operation is repeated several times, until no further decrease in the volume of the oil takes place, or better still, until the oil no longer shows Flückiger's test for thymol. To make this test put a few drops of the oil into a test tube, add about twenty drops of chloroform and a small quantity of solid NaOH and apply heat. If thymol is still present a red color will appear. When all the thymol has been removed notice the volume of the remaining oil carefully. The difference between the volumes of oil before and after shaking with the alkali gives the volume of thymol dissolved. From this the percentage of thymol by volume is readily calculated.

The alkaline solution of thymol is made up to 100 or 200 cc. as the case may require, using the 5 p. c. alkali as the diluent. To 10 cc. of this solution in a graduated 500 cc. flask is added 1/10 normal iodine solution in slight excess. The thymol is precipitated as a dark reddish-brown iodine compound. In order to know when a sufficient quantity of iodine has been added, remove a few drops from the flask to a test-tube containing some dilute hydrochloric acid. When sufficient iodine is present the color of the solution shows the presence of iodine, otherwise the liquid is milky due to the separation of thymol. The solution is now made slightly acid with dilute hydrochloric acid and diluted to 500 cc. From this 100 cc. are filtered off and the excess of iodine determined by titration with 1/10 normal sodium thiosulphate solution. The number of cc. required, multiplied by five, and deducted from the number of cc. 1/10 normal iodine added gives the number of cc. of iodine required by the thymol.

$$C_{10}H_{14}O + 4I + 2NaOH = C_{10}H_{12}I_2O + 2NaI + 2H_2O.$$

Every cc. 1/10 normal iodine solution equals 0.003741 gram thymol. Knowing the quantity of thymol in the alkaline solution the percentage in the original oil is readily found.

Mixtures of pure thymol with pure limonene and pure cymene respectively were made and subjected to the above method of estimation with the following results:

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* Ber. 23, p. 2753.

Thymol dissolved in:	Quantity present.	Quantity found.	
		Iodine method.	Solution method.
Cymene..........	25.00%	24.92 p. c. 25.34 "	28.00 p. c.
Limonene......	25.00%	25.25 " 25.60 "	30.00 "

It is clear that the potassium hydrate solution in the presence of thymol dissolves some of the other constituents, thus making the percentage of thymol by the solution method higher than it ought to be.

Having obtained satisfactory results with thymol further experiments were made with its isomer, carvacrol. It was found that the separation of the iodide as a flocculent precipitate was far more difficult than in the case of thymol where separation takes place immediately. Further, the iodide formed is not as stable in the solution as is that of thymol; even slight acidulation with hydrochloric acid produces some changes on standing. For these reasons slight modifications in the method are necessary.

Method for the Estimation of Carvacrol in Volatile Oils.

The shaking out of the carvacrol from the oil with 5 p. c. alkali solution is the same as that of the thymol. To 10 cc. of the alkaline solution in a graduated 500 cc. flask 1/10 normal iodine solution is added. To avoid a large excess of iodine the same test as for thymol is applied. The iodide of carvacrol is precipitated as a white, finely divided precipitate, giving the solution a milky appearance. By shaking the solution for a short time the precipitate becomes flocculent, leaving the solution clear or nearly so. Now dilute to 500 cc. and filter off 100 cc. Acidulate the filtrate with hydrochloric acid and titrate the liberated iodine with 1/10 normal sodium thiosulphate. The calculation of the percentage is the same as that for thymol. Every cc. of 1/10 normal iodine equals 0.003741 gr. carvacrol. This method for carvacrol differs from that of thymol only in that the separation of the iodide has to be induced by violent shaking and in that the iodide is removed by filtration before acidulating.

Several estimations of oils have been made. The results are given in the following table.

Oil.	Sp. Gr.	Iodine Method.		Solution Method.	
		Thymol.	Carvacrol.	Thymol.	Carvacrol.
Thyme...........	0.949	56.16 55.78	—	65.00	—
Monarda fistulosa...	0.935		58.48 58.00	—	70.00
		—	58.20 58.40	—	70.00
			53.34 53.66	—	64.50
Monarda fistulosa...	0.927	—	54.46 54.26	—	65.50

From these figures it will be seen at once that the solution method gives figures that are entirely too high, and they also show that the result is not even an approximate one. It is somewhat simpler, yet in the hands of one who has even but a slight knowledge of volumetric analysis the iodine method ought certainly not to prove difficult. The results obtained by using an oil of known thymol content certainly show this method to be far superior to the solution method. The iodine method has been used in this laboratory by students with only a moderate experience in quantitative work with good results. Further trials are now in progress.

These experiments on the estimation of phenols in volatile oils are being continued. At present eugenol and the oils containing it are under consideration.

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On the Chemical Composition of the Oil from Monarda Punctata (L).

By *Wm. R. Schumann* and *Edward Kremers*.

Introduction.

In a paper on the chemical composition of the volatile oil from *Monarda fistulosa*[1] one of us called attention to the fact that although examinations of four specimens of *Monarda punctata* have been recorded, none of these specimens are authentic.

In 1846 an oil of horsemint supposed to be derived from *Monarda punctata* was examined by Arppe[2]. In 1888 an examination of oils supposed to be obtained from *Monarda punctata* was made by Mr. Schroeter[3]. One sample of oil was taken from the cabinet of the Philadelphia College of Pharmacy where it had been standing for six years, during which time it had deposited crystals of thymol. The other two specimens were evidently obtained in the open market, from reliable sources.

However, for none of the four specimens of oil heretofore examined is there any positive guarantee given as to their source. Arppe separated mechanically a crystalline stearopten, evidently thymol which had been deposited upon standing. Schroeter states that the oil contains a hydrocarbon of the formula $C_{10}H_{16}$; thymol "which is dextrogyrate;" a compound $C_{10}H_{18}O$, boiling between 240°—250°; and formic, acetic and butyric acids.

The oils used, the methods employed, as well as the description of some of the results, e. g. the rotatory power of the optically inactive thymol, did not inspire confidence.

Some of these odd statements have crept into the literature of volatile oils. Thus Bornemann[5] calls attention to the supposed difference in rotatory power between thymol from oil of thyme and that from *Monarda*. He also mentions that the thymol from fresh monarda oil is noncrystallizable, whereas the crystallizability of the thymol increases with the age of the oil.

Experimental Part.

In view of the interesting results obtained upon examination of the oil from *Monarda fistulosa* obtained from authentic material and of some of the discrepancies that have crept into literature on the subject, another examination seemed called for.

The material from which the oil was obtained was collected early in August near Pine Bluff, about fifteen miles west of Madison, and was identified by Prof. L. S. Cheney of the University of Wisconsin.

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[1] Proceedings American Pharmaceutical Association, Vol. 43, p. 256. 1895.

[2] Pharmaceutische Rundschau, Vol. 13, p. 207. 1895. Annalen d. Chem. u. Pharm., 5, 8, 41.

[3] American Journal of Pharmacy, p. 113.

[5] Die Flüchtigen Oele, p. 372.

The flowering herb was distilled with water vapor while still fresh, about one-half of a pound of oil being obtained. The oil is of an amber or light yellowish color with a pleasant yet characteristic mint-like odor, sp. gr. 0.9307 at 20°. It turns the plane of polarization $+0.05479$ to the right at 20°, hence $[\alpha]_D = +0.0588$.

Separation of Phenol.

In order to remove the phenol the oil was shaken with 10 p. c. caustic soda solution.

(1) From 25 cc. of oil shaken with 50 cc. of the soda solution, 14 cc. went into solution or 56 p. c. phenol.

(2) A duplicate experiment gave identical results.

(3) From 150 cc. of oil shaken with 350 cc. of soda solution, 84 cc. went into solution or 56 p. c.

The alkaline solution of phenol was distilled with water vapor to remove any non-phenol portion of the oil that might have gone into solution. The solution was then acidulated with sulphuric acid and the distillation continued. The distilled oily phenol was dried with exsiccated sodium sulphate and exposed to the temperature of a winter's night, when it solidified to a crystalline mass. The melting-point of the dried almost colorless crystals was found to be 50°. With chloroform and caustic soda it gave the characteristic reactions of thymol and carvacrol. The melting-point, however, excludes the latter.

Non-Phenol Constituents.

That portion of the oil which was not dissolved by shaking with 10 p. c. soda solution was distilled with water vapor. 79.3 grams of oily distillate were obtained. This was dried. Inasmuch as the original oil had been shaken only once with caustic soda, the oily distillate still gave a reaction for thymol when tested according to Flückiger[4] with chloroform and caustic soda solution. This reaction, however, is very delicate and would indicate traces of the phenol.

The oil deprived practically of thymol had a sp. gr. of 0.887. In a 100 mm. tube it turned the plane of polarized light 1.7166° to the right. Upon fractionation the following fractions were obtained:

78°— 88°	3.5 cc.
88°— 98°	1.75 cc.
98°—166°	about 7.0 cc.
166°—172°	4.0 cc.
172°—178°	13.0 cc.
178°—186°	0.5 cc.
186°—202°	6.0 cc.
202°——	———

Fraction 172°—178°.

It was shown by Mr. Brennan a year ago that the oil of *Monarda fistulosa* contained cymene. The large yield of this fraction suggested the possibility of the presence of this hydrocarbon in this closely related oil. In order to ascertain its presence or absence, 7 cc. of this fraction were heated with a dilute solution of 30 gm. of potassium permanganate until the color disappeared. The solution was then filtered and evaporated to dryness, the residue then dissolved in water and acidulated with sulphuric acid. A dense whitish precipitate was formed. After recrystallization from alcohol the melting-point was found to be 155°—156°, which is that of oxycumic acid, thus proving the presence of cymene.

Fraction 186°—202°.

On account of the small amount of this fraction, a combustion only could be made in order to ascertain the probable presence of linalool or a similar body.

(1) 0.1372 g. of substance gave 0.1340 g. $H_2O = 0.01488$ g. H. and 0.4145 g. $CO_2 = 0.11304$ g. C.

(2) 0.13089 g. of substance gave 0.1285 g. $H_2O = 0.01427$ g. H. and 0.3749 g. $CO_2 = 0.1101$ g. C.

(3) 0.1289 g. of substance gave 0.1322 g. $H_2O = 0.0149$ g. H. and 0.3809 g. $CO_2 = 0.10388$ g. C.

	Calculated for $C_{10}H_{18}O$.	Found. I.	II.	III.
C.	77.92%	82.39%	78.08%	80.6%
H.	11.69%	11.84%	11.25%	11.6%
O.	10.37%	6.77%	10.67%	7.8%

These results do not agree very well, nor can the fractions after but one fractionation be considered pure. The amount of oxygen, however, makes the presence of some oxygenated substance like linalool probable.

* * *

May 31st of this year about 30 pounds of young plants not yet in blossom were collected near Arena, Wis., by Prof. Cheney. From the partly dried herb about 118 grams of oil or 3.39% were obtained by distillation with water vapor. The oil possessed a slightly reddish color and had a sp. gr. of 0.925 at 20°. The rotatory power could not be taken on account of the dark color of the oil. A volumetric estimation of thymol was made.*

1. (a) 4.4580 grams of oil were diluted to 13.0 cc. with petroleum ether and shaken with 5 p. c. soda solution until the volume of the ether solution remained unchanged and thymol was no longer indicated by Flückiger's reaction.
   Loss of volume, 3.0 cc.=61.22% phenol.
   (b) Alkaline solution of thymol diluted to 100 cc. with 5 p. c. soda solution.
      (α) 10 cc. of this solution required 73.5 $\frac{N}{10}$I solution for precipitation of phenol, hence $75.3 \times 0.0037415 =$ 61.68% thymol.
      (β) A duplicate test gave identical results.
2. (a) 5.7887 g. diluted to 13.3 cc. lost 3.9 cc., hence 61.9% phenol present.
   (b) Alkaline solution of thymol diluted to 100 cc. with 5% soda solution.
      (α) 10 cc. required 95.0 $\frac{N}{10}$I V. S. for precipitation of phenol, hence present 61.4% thymol.
      (β) A duplicate test gave identical results.

Table of Results.

	Shaking out Process.	As Thymol Iodide.
Exp. 1	61.22%	61.68%
Exp. 2	61.9 %	61.4 %

Pharm. Chem. Lab., Univ. of Wis.

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[4] F. A. Flückiger, Reactionen, p. 156.

* For the details of this process compare The volumetric estimation of phenols by E. Kremers and O. Schreiner.

History and Names of Rhamnus Purshiana (Cascara Sagrada).*

By *J. U. Lloyd.*

Contribution of the Research Committee of the American Pharmaceutical Association.

In a paper contributed to New Preparations† October 15th, 1877, p. 8, the late Dr. J. H. Bundy, an eclectic physician of Colusa, California, commended "Cascara Sagrada" as a valuable remedy in the treatment of constipation. This notice was by means of a brief note that was part of a paper on Berberis aquifolium, Dr. Bundy promising, however, to give it further attention as follows:—

"It is not my purpose to treat on Cascara Sagrada in this paper but using it in connection with the Berberis, I simply make mention of it. In the future I will introduce this drug to the profession."

This, so far as the writer can determine, was the first reference concerning this remedy in pharmaceutical or medical print. Agreeable to promise, in January, 1878,‡ Dr. Bundy contributed a paper on the subject "Cascara Sagrada" in which he gave the uses of fluid extract of "Cascara Sagrada". Following this came many papers from Dr. Bundy and other physicians, twenty contributions on the subject being printed in New Preparations, 1878, to which journal with few exceptions the subject was confined during 1877 and 1878. Dr. Bundy stated in his paper (1878) that "A description of the Cascara I am unable to give at this time, but suffice it to say that it is a shrub, and in due time its botanical name will be known." He neglected, however, to concern himself further in the matter.

In the fall of 1878, Dr. C. H. Adair, of Colusa, California, a partner of Dr. Bundy, sent the writer specimens of the bark and botanical specimens of the tree or shrub yielding it. These on identification by Mr. Curtis G. Lloyd proved to be Rhamnus Purshiana. This fact was announced in a paper on Some Specimens of Western Plants, presented to the American Pharmaceutical Association, held in Atlanta, Ga., November, 1871 (Proceedings, 1879, p. 707), and completed the drug's history.

Names.

Dr. Bundy supplied the drug under the Spanish name "Cascara Sagrada", which name is said to have been in local use throughout some sections of California, and soon came to be the common name of the drug. It will surely dominate all others as long as the drug is in use. The anglicised name "Sacred Bark" has also been applied to the drug, and the Scriptural term Chittem Bark was also employed in early days in some parts of California, but these last names are now obsolete.

Summary.

To Dr. J. H. Bundy, Colusa, California, 1877, is due the credit of introducing the bark of Rhamnus Purshiana (Cascara Sagrada) to the medical profession.

To New Preparations, Parke, Davis & Co. of Detroit, Michigan (1877 and 1878), is due the credit of bringing the drug to the attention of physicians and pharmacists.

To Parke, Davis & Co. of Detroit, Michigan (1878), is due the credit of making the first pharmaceutical preparation (the fluid extract) and of bringing this preparation into general conspicuity, through their advertisements and business connections. It may be said without danger of controversy that this firm introduced and established Cascara Sagrada as a remedy.

To Dr. C. H. Adair (1878), of Colusa, California, is due the credit of furnishing the botanical specimens that established the drug's botanical position.

Medicinal Plants of Brazil.*

By *Dr. Theodor Peckolt of Rio de Janeiro.*

Popular Remedies from the Lauracæ.

Persea alba Nees. Kommt vor in den nördlichen Staaten, vorzugsweise in Goyaz und Alagoas, wo dieselbe *Lauro* — Lorbeer benannt wird. In Pernambuco heisst dieselbe *Lauro conga de porco* — Schweinjoch Lorbeer.

Ein ansehnlicher Baum mit dunkelbrauner, glatter Rinde. Die Blätter sind kurzgestiehlt, steif, lederartig, lancettlich, mattgrün, unterseits hellgelblich. Der Blüthenstand besteht aus kurzen Rispen. Die Frucht ist eine kleine, runde Beere.

Die Pflanze wird nicht arzneilich benutzt. Das weisse, etwas poroese Holz wird zu Brettern, aus welchen Marmeladen- und Confectkisten angefertigt werden, sowie auch zu verschiedenen Küchengeräthschaften verarbeitet. Die gegabelten Aeste dienen als Joch für Schweine, um dieselben zu hindern die Umhegung der Weide zu passiren.

Persea alba Nees. Occurs in the northern states, especially in Goyaz, and Alagoas, where it is called *Lauro* — Laurel. In Pernambuco it is known as *Lauro conga de porco*—swine's yoke laurel.

A considerable tree with dark brown, smooth bark. The leaves are short petioled, stiff, leathery, lanceolate, dull green, the under side bright yellowish. The inflorescence consists of short panicles. The fruit is a small, round berry.

This plant is not used medicinally. The white, somewhat porous wood is made into boards out of which containers for marmalade and confectionery are constructed. It is also worked up into various kitchen utensils. The forked branches are used as yokes for swine to prevent them from going through pasture fences.

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* New Preparations, Detroit, Parke, Davis & Co.

† Introductory to a contribution from chemical investigations of Rhamnus Purshiana, undertaken by Alfred R. L. Dohme.

‡ New Preparations, January, 1878, p. 1.

* Continued from p. 51. Translated for the Review by Dr. R. H. True, Asst. Prof. of Pharmacognosy at the University of Wisconsin.

Persea splendens var. chrysophylla Meissn. Bekannt als *Lauro amarello*—gelber Lorbeer — in den Staaten Goyaz, Bahia, Pernambuco und Parà.

Ein bis neun Meter hoher Baum. Blätter länglich, lancettlich. Blüthenstand eine astige Rispe. Beere rothbräunlich, von der Grösse einer grossen Olive. Das hellgelbe Holz ist ungemein dauerhaft und zum Schiffsbau wie auch Häuserbau besonders geschätzt, da es nicht von der Holz zerstörenden Termite beschädigt wird. Da es sich leicht poliren lässt werden elegante Möbel davon angefertigt. Sp. Gew. 0.521 bis 0.530.

Persea gratissima Gaertn. Diese Pflanze fehlt in keinem Garten der tropischen Staaten und soll in den Staaten Parà und Amazonas im Urwald vorkommen; doch ist die Benennung nicht einer der Sprachen der brazilianischen Eingebornen entnommen, sondern der Caraibensprache, nämlich dem Worte *abacate*. Der frühere Portugiese, und der ungebildete Arbeiter noch jetzt, braucht in seiner Aussprache das c statt v, z. B. cinho statt vinho etc. Auf diese Weise ist die hier gebräuchliche Benennung *abacate* für die Frucht entstanden und *abacateiro* für den Baum.

Der Baum gedeiht hier sehr leicht und liefert nach fünf Jahren schon Früchte. Er erreicht gewöhnlich eine Höhe von 12 Meter bei 62 Centim. Durchmesser. Die Früchte reifen im April und werden wie die Bananen geerntet wenn sie vollständig entwickelt aber noch hart sind. Auf Stroh gelegt werden sie dann in einigen Tagen zur Reife gebracht. Durch die langjährige Kultur haben sich mehrere Varietäten entwickelt. Hier im Staate Rio de Janeiro sind nur zwei derselben bekannt.

1.) **Abacate royo.** Violette Abacate. Dieselbe hat die Grösse der gewöhnlichen Abacatefrucht. Die Fruchtschale ist von braunrother und violettrother Farbe; das Fruchtfleisch dunkelgrün und wohlschmeckender als das der gewöhnlichen Abacate.

2.) **Abacate piqueno.** Wahrscheinlich aus der vorhergehenden entstanden und erreicht nur die Grösse einer Bergamottbirne. Die Fruchtschale ist hellviolett, das Fruchtfleisch dunkelgrün.

Diese ist die wohlschmeckendste und zarteste der drei Sorten. Die Beere des gewöhnlichen und häufigsten Abacatebaumes hat die Form und Grösse einer Tafelbirne. Die dünne, lederartige, hellgrüne Fruchtschale enthält ein mattgrünes Fruchtfleisch, welches in 2 bis 3 cm. dicker Lage den Walnussgrossen rothbräunlichen Samenkern umgiebt.

Die Früchte wiegen von 400 bis 600 Grm. und bestehen aus 5 p. c. Fruchtschale, 75 p. c. Fruchtfleisch und 20 p. c. Kern. Die frische Fruchtschale enthält 78.470 p. c. Wasser, 1.165 p. c. Chlorophyll und Fett, 1.300 p. c. hellbraunes Harz, 0.130 p. c. Eisen grünende Gerbsäure, Eiweiss, sowie Spuren von Zucker etc. Gekocht wird dieselbe dem Schweinefutter beigemischt. Die Samenkerne sind rund, rothbräunlich und spalten sich leicht in zwei Samenlappen. Auf der Spaltungsfläche sind sie glänzend dunkelroth. Dieselben wurden zuerst 1829 von Ricord-Madiana, dann von Pibram und 1866 von Dr. Wittstein untersucht. Derselbe fand in den Samen: Butterartiges Fett, 7 p. c.; braun-rothes Harz, 5.4 p. c.; Stärkemehl, 10 p. c.; Proteinsubstanzen, 11 p. c.; Bitterstoff; gelbes Harz; Eisen grünende Gerbsäure etc. Madiana fand auch Gallussäure, und Pibram erhielt durch Destillation ein stearoptenartiges ätherisches Oel von campherartigem Geruch und Geschmack. Meine Untersuchung der Samenkerne ergab: Wasser, 56.876;

Persea splendens var. chrysophylla Meissn. Known as *Lauro amarello*—yellow laurel — in the states Goyaz, Bahia, Pernambuco, and Parà.

A tree one to nine meters high; leaves oblong or lanceolate; inflorescence a branching panicle; berries reddish-brown, of the size of a large olive. The light yellow wood is unusually durable and especially valuable in the construction of ships and houses, since it is not harmed by the wood-destroying termites. Because it is easily polished, elegant furniture is made of it. Spec. grav. 0.521 to 0.530.,

Persea gratissima Gaertn. This plant is lacking in no garden in the tropical states and is reported as present in the primeval forests of the states of Parà and Amazonas; still the name is not derived from the language of the Brazilian natives, but from the Caribbean language, from the word *abacate*. The earlier Portugese and the uneducated laborer even to-day in his speech uses c instead of v, e. g. *cinho* instead of *vinho*, etc. In this way the name here used for the fruit, *abacate*, originated, also *abacateiro* for the tree.

The tree flourishes readily here and in about five years bears fruit. It attains usually a height of twelve meters with a diameter of sixty-two centimeters. The fruits ripen in April and, like bananas, are gathered after they are completely developed, but still hard. They are laid on straw and ripen in a few days. By long cultivation, a number of varieties have developed. Here, in the state of Rio de Janeiro, but two are known.

1.) **Abacate royo.** Violet abacate. The size is that of the usual abacate fruit. The rind is of a brownish-red and violet color, the flesh of the fruit dark green and of more agreeable taste than the common abacate.

2.) **Abacate piqueno.** Probably originated from the above and attains only to the size of a bergamot pear. The rind is light violet, the flesh dark green. This is the most palatable and delicate of these kinds.

The berry of the common and most abundant abacate tree is in form and size like the table pear. The thin, leathery, light green rind encloses a pale green flesh, which surrounds, in a layer two to three centimeters thick, a reddish-brown seed of the size of a walnut.

The fruits weigh from 400 to 600 grams and consist of rind, 5 percent; flesh, 75 percent; seed, 20 percent. The fresh peel contains 78.470 percent water; 1.165 percent chlorophyll and fat; 1.300 percent light brown resin; 0.130 percent tannin colored green with iron salts; proteid, traces of sugar, etc. After being cooked, they are mixed with the feed for swine. The kernel of the seed is round, brownish-red, and the cotyledons are easily split apart. The split surfaces are shining dark red. The seeds were first investigated in 1829 by Ricord-Madiana, later by Pibram, and in 1866 by Dr. Wittstein. Wittstein found in the seeds the following: Butter-like fat, 7.0; brownish-red resin, 5.4; starch, 10.0; proteid substances, 11.0 percent. Bitter principle, yellow resin, tannin colored green with iron salts etc. Madiana found also gallic acid, and Pibram obtained by distillation a stearopten-like, ethereal oil with camphoraceous odor and taste. My investigation of the seed gave the following: water, 56.876; fatty oil, 0.129; starch, 8.534;

fettes Oel, 0.129; Stärkemehl, 8.534; Glycose, 1.080; Eisen grünende Gerbsäure, 1.572; Perseit, 3.820; Proteinstoffe, 1.300; rothes Harz, 2.328; Extract, 2.092; Asche, 1.010 Procent.

Eine grosse Portion der frischen, geruchlosen Kerne wurde destillirt, aber auch nicht eine Spur eines ätherischen Oeles erhalten; ebensowenig gelang es, Gallussäure nachzuweisen. Das Fruchtfleisch wurde ebenfalls zuerst von Ricord-Madiana untersucht. Derselbe fand: Fettsubstanzen, 9.9; stickstoffhaltige Materie, 5.6; Gummi, 5.6; Faser, 1.2 Procent. In dem Fruchtfleische der unreifen, noch nicht vollständig entwickelten Frucht fand er 10.058 Procent Stärkemehl, sowie Gerbsäure, welche beim Reifen verschwindet. Meine Untersuchung des frischen, reifen Fruchtfleisches ergab: Wasser, 80.670; gelbes, fettes Oel, 8.500; Glycose, 3.175; Stärkemehl, 1,877; Proteinstoffe, 1.635; Perseit, 0.783; Aepfelsäure, 0.049; Weinsteinsäure, 0.082; Extract etc., 2.775; Asche, 0.980 Procent. Dr. Busse, Assistent des Prof. Dr. Ludwig in Jena, fand in 100 Theilen Trockensubstanz 1.353 Theile Stickstoff. Dieselbe ist also reicher an Proteinsubstanz als Mandioccamehl (0.322 p. c.) und Mais (0.9 p. c.), und steht an Gehalt von Kohlehydraten wenig zurück. Die Frucht wird daher mit Recht wie Banana und Brodfrucht als Nahrungsmittel benutzt. Im Fruchtfleisch ist keine freie Säure vorhanden. Die organischen Säuren sind an Kalk und Kali gebunden. Deshalb besitzt die Frucht einen faden, süsslichen Geschmack. Der Volksinstinkt hat zum Genuss derselben, durch Zusatz von Citronensäure und Zucker, das Richtige getroffen, um dieselbe wohlschmeckend zu machen. Das fette Oel ist transparent, gelblich, geruchlos, von mildem Geschmack, dem Provenceröl sehr ähnlich.

glucose, 1,080; tannin colored green with iron salts, 1.572; perseite, 3,820; proteid substances, 1.300; red resin, 2.328; extractive, 2.092; ash, 1.010 percent.

A quantity of the fresh, odorless kernels was distilled but no trace of an ethereal oil was detected; the attempt to find gallic acid was likewise fruitless. The flesh of the fruit was also first investigated by Ricord-Madiana. He found as follows: fatty substances, 9.9; nitrogen-containing substances, 5.6; gum, 5.6; fibre, 1.2 percent. In the flesh of the unripe, incompletely developed fruit he found 10.058 percent starch as well as tannin which in ripening disappeared. My investigation of the fresh, ripe flesh of the fruit gave as follows: water, 80.670; yellow fatty oil, 8.500; glucose, 3.175; starch, 1,877; proteid, 1.635; perseite, 0.783; malic acid, 0.049; tartaric acid, 0.082; extractive etc., 2.775; ash, 0.980 percent. Dr. Busse, assistant to Prof. Dr. Ludwig at Jena, found in 100 parts of dry substance 1.353 parts of nitrogen. It is, therefore, richer in proteids than in manioc meal (0.322 percent) and maize (0.9 percent) and the carbohydrate content is but a little less. The fruit is, therefore, rightfully used, like the banana and the bread fruit, as an article of nutrition. The fruit-flesh contains no free acids. The organic acids are combined with calcium and potassium, therefore the fruit has an insipid, sweetish taste. To make the fruit more palatable, the popular instinct has found the right means in the addition of citric acid and sugar. The fatty oil is transparent, yellowish, odorless, of a mild taste, similar to that of Provence oil.

(To be continued.)

TRANSLATIONS.

Reagents and Reactions known by the Names of their Authors.*

Based on the original collection by *A. Schneider*, revised and enlarged by Dr. *Julius Altschul.*

Drouot's test for margarin in butter. The sample is melted: butter is transparent, margarin turbid. *Bischoff*, also *Jahr* have recently devised apparatus whereby the behavior of the molten fat when shaken with warm water can be observed. Margarin rapidly separates from the water, whereas the butter is completely emulsified. For details see Ph. Centrh., 37, p. 43.

Dudley's reagent for glucose. Bismuth subnitrate is dissolved in a little nitric acid, an equal volume of acetic acid is added to the solution and diluted with water to ten times its volume. The urine to be tested is made alkaline, a few drops of the reagent are added and the mixture boiled for from 20 to 30 seconds. In the presence of glucose the bismuth compound is reduced, a black precipitate being produced.

Comp. *Aimén's*, *Boettger's* tests.

Duflos' aniline reaction. With dilute sulphuric acid and a trace of lead peroxide aniline produces a greenish color.

Dupasqier's reagent for organic substance in water is an aqueous solution of gold chloride. If water is boiled with this reagent the presence of organic matter is indicated by a blueish-violet color due to the reduction of the gold, or by the formation of a gold mirror.

Eboli's reaction for cantharidin. The solution to be tested is heated with sulphuric acid and potassium-bichromate is added. If cantharidin is present a handsome green color is produced.

Ehrlich's diazo-reaction is the test for pathologically changed urine by means of diazo-benzene sulphuric acid. *Pentzoldt* (q. v.) uses the reaction for the detection of glucose (upon the addition of potassa), *Ehrlich* and others for the diagnosis of various diseases (upon addition of ammonia), especially for the detection of bile coloring matter. The directions differ materially. The reagent is always freshly prepared, e. g. according to the following formula:

a.		*b.*	
Sulphanilic acid...	5	Sodium nitrite.......	0.5
Hydrochloric acid	50	Water....................	100
Dist. water	1000		

For use, 6 ccm. of solution *b* are added to 250 ccm. of solution *a*.

According to more recent statements a diazobenzene sulphuric acid 1:60 is employed as *Ehrlich's* reagent.

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* Continued from p. 205.

Urine is tested according to different methods:

I. Equal volumes of urine and the reagent are mixed and ⅛ volume of ammonia is added. In case of typhus, pneumonia, measles, the solution is colored red, the color being readily recognizable in the foam when the solution is shaken.

II. According to Charité, Annalen, 1886, for the detection of bile coloring matter, *Erlich's* reagent is added to urine diluted with an equal volume of dilute acetic acid. The resulting dark color is converted into violet upon the addition of an acid, particularly of glacial acetic acid.

III. The urine to be tested is shaken with chloroform. To the chloroformic solution 1 to 2 volumes of *Ehrlich's* reagent and sufficient alcohol to make the mixture homogeneous are added. If bilirubin is present a red color is produced, which upon careful addition of concentrated hydrochloric acid is converted into violet and blue. Upon the addition of potassa solution three zones are produced, a lower greenish-blue one, an upper pure blue zone and between a reddish band.

Erlich's gentian violet solution for staining bacteria is produced by shaking 4 ccm. aniline with 100 ccm. distilled water and separating the solution from the undissolved aniline by filtration through a moist filter. To the filtrate 11 ccm. of a concentrated alcoholic solution of gentian violet are added while shaking, and the mixture is allowed to stand for 24 hours.

Einbrodt's reagent for ammonium salts is a solution of mercuric chloride made slightly alkaline by the addition of potassium carbonate. With ammonium salts this solution produces a white turbidity or precipitate.

Einhorn's test for sugar in urine by means of the fermentation method. The formation of carbonic acid upon treating the urine with yeast is construed as a certain indication of the presence of glucose in the urine. *Einhorn* and others (v. *Arndt*) have constructed special fermentation saccharometers, which permit an exact quantitative estimation.

Erdmann's reagent for alkaloids. Six drops nitric acid 1.25 are mixed with 100 ccm. water and of this solution 10 drops are added to 20 ccm. pure concentrated sulphuric acid. According to another statement 10 drops of nitric acid 1.185 are diluted with 20 ccm. water and 20 drops of this solution are added to 40 ccm. pure concentrated sulphuric acid. To 1 to 2 mg. of the dry alkaloid, placed on a watch-glass over white paper or in a white porcelain dish, 1 ccm. of the reagent is added and the mixture is set aside for ¼ to ½ hour at a temperature of from 18 to 22° C. As to the resulting color reaction consult *Hager*, Pharm. Praxis I, 208.

Erlicki's solution, a hardening solution for microscopic preparations, contains 2.5 g. potassium bichromate and 0.5 g. copper sulphate in 100 ccm. water.

Errera's solution for the extraction of alkaloids is an alcoholic 5 p. c. tartaric acid solution.

Erbach's reagent for albumen is a solution of 10 g. picric acid and 20 g. citric acid in 1 l. water. In albuminous solutions (urine) the reagent produces (eventually upon the addition of acetic acid) a yellow precipitate. The amount of the latter, which can be estimated approximately in the albuminometer, can serve also for the quantitative estimation of albumen.

Erbach's ureometer. See *Huefner's* reagent.

Eykmann's phenol reaction. A very dilute phenol solution produces upon the addition of a few drops of spirit of nitrous ether in contact with concentrated sulphuric acid a red zone reaction.

Farrant's solution, a preservative for microscopic preparations, consists of 1 p. gum arabic, 1 p. glycerin and 1 p. concentrated aqueous solution of arsenious acid.

Faure's test for genuine wine coloring matter. If to 2 ccm. red wine 10 drops of a 2 p. c. tannin solution and 6 drops of a 2 p. c. gelatine solution are added, the coloring matter from wine is completely precipitated, whereas coal-tar dye-stuffs remain in solution.

Fehling's solution for the estimation of sugar and reagent for other reducing substances. For immediate use equal volumes of the following solutions are mixed.

I. 34.639 g. crystallized, not effloresced copper sulphate are dissolved in water and the solution diluted to 500 ccm.

II. 173 g. crystallized Rochelle salt and 50 g. caustic soda are dissolved in sufficient water to make 500 ccm.

To the reagent diluted with 5 p. of water the sugar solution of about 1 p. c. strength is gradually added. Discoloration takes place and red cuprous oxide is precipitated. 10 ccm. of *Fehling's* solution are reduced by 0.05 g. grape sugar, 0.067 g. milk sugar, 0.0475 g. cane sugar and 0.045 g. dextrin or starch, the last three having been previously inverted with dilute mineral acid. It should be understood that many other substances also reduce *Fehling's* solution.

According to an older formula *Fehling's* solution was prepared as a single solution and had to be prepared fresh every time since the mixed solutions do not keep well.

Solutions identical with or similar to *Fehling's* reagent are *Barreswil's*, *Frommherz's*, *Trommer's*, *Violette's* and *Worm-Mueller's* solutions (q. v.).

Fiebig's sugar estimation by means of the fermentation glucoseometer. See *Einhorn*.

Finkelnburg's reagent for excrements in the examination of soil and water is an alkaline solution of silver oxide in sodium thiosulphate. If substances containing excrements are boiled with hydrochloric acid for several minutes, then made alkaline with soda and again heated to the boiling-point with the reagent, a dark reddish-brown precipitate is found, whereas the solution remains light brown in color.

Finkener's test for impurities in castor oil. 10 ccm. of oil are shaken with 50 ccm. alcohol, sp. gr. 0.829 at 17.5°. If a turbidity is produced which does not disappear when the mixture is heated to 20° at least 10 p. c. of foreign oils have been added.

Filsinger's test for cacao oil (modified ether test). Two g. of oil are shaken in a graduated tube with 6 ccm. of a mixture of 4 p. ether 0.725 and 1 p. alcohol 0.810 and set aside. Pure oil yields a clear solution which does not become turbid at 0°.

Fischer's reagent is phenylhydrazine. With aldehydes, ketones, carbohydrates it yields condensation products which are difficultly soluble. In order to test for sugar in urine, 50 ccm. of the latter are heated with 2 g. phenylhydrazin hydrochlorate and 4 g. sodium acetate for ½ to 1 hour on the waterbath. If sugar is present, phenylglycosazone is precipitated. This is dissolved in alcohol, water is added and the alcohol is evaporated. The resulting needles of the glycosazone melt at 204 to 205°.

Fleischl's test for bile coloring matter. See *Gmelin's* test.

Fleitmann's arsenic test. See *Marsh's* arsenic test.

Flueckiger's arsenic test. In place of the silver nitrate used according to *Gutzeit* (q. v.) solution of corrosive sublimate is employed. With it arsenuretted hydrogen produces a yellow spot, which is darkened by water but is permanent toward alcohol. Very dilute antimony hydride does not affect the corrosive sublimate. Somewhat less diluted it produces a brown spot which disappears upon the addition of alcohol if sufficient sublimate was on the test-paper.

Flueckiger's reaction for quinine. If to a solution of quinine bromine water and an excess of ammonia are added, an emerald-green color is produced (Thalleiochin reaction). Compare *Brand's* reaction.

Flueckiger's test to distinguish between naphtholes. If 0.2 g. naphthol are shaken with 0.2 g. mercuric chloride, 0.1 g. nitric acid and 10 ccm. water at 100°, α-naphthol is indicated by a slight scarlet-red precipitate, whereas β-naphthol yields a voluminous reddish-brown precipitate.

Flueckiger-Behren's test for sesame oil. Five drops of sesame oil when treated with 5 drops of a cold mixture of equal parts of concentrated sulphuric acid, nitric acid and water, produce a green zone. If 5 drops of carbon disulphide are immediately added an upper greenish layer is produced, which becomes discolored more slowly than the original color.

Focke's test for grape sugar. See *Trommer's* reaction.

Fokker's reaction for the detection of uric acid. If to urine containing uric acid, previously made alkaline with soda, solution of ammonium chloride is added, the difficultly soluble urate of ammonium is formed. This test is also used, especially according to *Salkowsky's* modification, for the quantitative estimation.

Formanek's reaction for alkaloids. Various alkaloids, after the evaporation of their solutions in nitric acid (see *Vitali*), yield characteristic color reactions when treated with ammonia and the alkalies. For details consult Ph. C. 36, p. 600.

Fraude's reagent for alkaloids is an aqueous solution of perchloric acid, sp. gr. 1.13 to 1.14. Upon boiling a trace of the alkaloid with several cubic centimeters of the reagent, aspidospermine is colored bright red, brucine madeira red, strychnine reddish-yellow.

Fresenius' phenol reaction. If phenol is boiled with a solution of mercurous nitrate containing traces of free acid, metallic mercury is precipitated and the odor of salicylic aldehyde is produced. Comp. *Plugge's* phenol reaction.

Fresenius' detection of nitrous acid by distillation. The water to be examined is acidulated with acetic acid and distilled. The distillate is collected in potassium iodide starch solution acidulated with sulphuric acid, whereby nitrous acid is indicated by the formation of a blue color.

Frey's fuchsine solution for staining microscopic preparations is a solution of 0.01 g. crystallized fuchsine, 20 to 25 drops absolute alcohol and 15 ccm. water.

Fritsche's reagent is dinitroanthraquinone. With many hydrocarbons it yields crystalline compounds.

Froehde's reagent for alkaloids is a freshly prepared solution of 0.01 g. sodium molybdate in 1 ccm. concentrated sulphuric acid (according to others 0.01 g. : 10 ccm., also 1 g. : 10 ccm.). With alkaloids and glucosides it produces characteristic color-reactions. For details consult *Hager*, Pharm. Praxis I, 208. Proteïnes produce a dark blue color.

Froehde's hydrocyanic acid reaction. If a cyanide is fused with sodium thiosulphate, the fuse dissolved in water and some ferric chloride added a blood-red color results.

Frommherz's solution for the detection of glucose consists of 41.76 g. crystallized copper sulphate, 20.88 g. potassium bitartrate and 10.44 g. potassa dissolved in water sufficient to make a liter. See *Fehling's* solution.

Fuerbringer's reagent for albumen is a mixture of mercuric and sodium chloride with citric acid and sodium chloride. In albuminous urine the reagent produces a turbidity or a flocculent precipitate. Inasmuch as uric acid is likewise precipitated the urine must first be diluted. See *Stuetz's* albumen capsules.

Gabbet's dye for tuberculose bacilli consists of 2 g. methylene blue, 25 g. concentrated sulphuric acid and 75 g. water.

Gaglio's test for mercury vapors in the atmosphere. The air to be tested is passed through a solution of palladium chloride in 500 p. water. (The palladium chloride is previously dissolved in hydrochloric acid with the aid of nitric acid and repeatedly evaporated to dryness with hydrochloric acid.) If mercury is present the solution is reduced as shown by the formation of black spots.

Gallois' test for inosite in urine. After the glucose is removed by fermentation and the albumen by boiling the urine is evaporated to a small bulk and a few drops of mercurous nitrate solution are added. If inosite is present the residue upon complete evaporation is yellow. (Albumen colors the residue rose-red, sugar colors it black; hence these must be removed completely.)

Ganther's blood-reaction. Minute traces of blood eliberate oxygen from hydrogen peroxide producing foam. Other animal substances produce the same phenomenon.

Gardiner's reagent for tannic acid is a solution of ammonium molybdate, which produces a yellow precipitate with the acid.

Gassend's modification of *Baudouin's* reaction (q. v.) for sesame oil consists in the addition of sodium bisulphite, which removes the color occasionally produced with genuine olive oil, but does not affect that produced by sesame oil. To 15 ccm. oil and 10 ccm. of sugar solution in hydrochloric acid 2 to 3 ccm. of a 10 p. c. bisulphite solution are added, the mixture shaken and set aside for 5 minutes. If the red color remains the oil is supposed to be adulterated with sesame oil.

Gautier's precipitation of tannin is effected by shaking with cuprous carbonate and the addition of alcohol, or by the addition of aqueous copper acetate 1:30.

Gautier's reagent consists of 250 ccm. soda-solution, 50 ccm. 3 p. c. copper sulphate solution and 700 ccm. glacial acetic acid. This mixture precipitates serum-albumen from its solutions, but not egg-albumen.

Geissler's test-paper for albumen consists of strips of filter-paper, half of which are saturated with concentrated citric acid solution, half with 3 p. c. sublimate solution to which 12 to 15 p. c. potassium iodide have been added. First a strip of the acid paper is dipped into the urine to be tested, then the mercury-potassium iodide paper. If albumen is present a precipitate results. Concentrated urine must first be diluted. See *Oliver.*

Geitel's test for neutral fat in free fatty acids. Two gr. of the fatty acids are dissolved in 15 ccm. hot alcohol and 15 ccm. ammonia are added. If a considerable percentage of neutral fat is present the solution becomes turbid. Traces of neutral fat are detected by adding carefully a layer of cold methyl alcohol. If neutral fat is present a turbidity is produced at the zone of contact.

Geogehan's acid reaction. All inorganic as well as organic acids with the exception of hydrocyanic acid precipitate red mercuric iodide from the solution of the double salt of mercuric cyanide and potassium iodide.

Gerard's test for coloring matter from the bile. Solution of iodine in aqueous potassium iodide is added in small quantity to the chloroformic extract of the urine to be tested. If potassa solution is added the reddish color of the chloroformic extract disappears and in the presence of bile coloring matter the potassa solution is colored green.

Gerrard's test for atropine and hyoscyanine is a solution of 5 g. mercuric chloride in 95 g. 50 p. c. alcohol. If 2 ccm. are heated with 0.001 g. atropine a red precipitate is formed. Hyoscyamine produces a similar precipitate. Homatropine is not precipitated.

Giessel's reaction for cocaïne. 5 ccm. of a 1 p. c. solution of cocaïne yield upon the addition of 2 ccm. saturated potassium permanganate solution a violet precipitate of cocaïne permanganate.

Girard's reaction for coaltar dyestuffs in wine. To 20 ccm. of the wine to be tested 4 ccm. of 10 p. c. potassa solution and 20 ccm. of a 5 p. c. mercurous sulphate solution are added, the mixture shaken and filtered. Natural wine yields a colorless, artificially colored wine a red filtrate.

Glaessner's reaction for the distinction between fatty oils depends upon the behavior of these oils toward fuming nitric acid, concentrated sulphuric acid and carbon disulphide. For details consult *Benedikt*, Analyse der Fette, 2, p. 309.

Gmelin's salt is potassium ferricyanide.

Gmelin's reaction for biliary coloring matter. A layer of the urine to be tested is carefully poured over fuming nitric acid. In the presence of biliary coloring matter zone color-reactions are produced changing from green to blue, violet, red and yellow. In order to concentrate the intensity of the reaction a precipitate of barium sulphate is produced in the urine which carries with it the coloring matter. The collected and dried precipitate is then tested with nitric acid.

Modifications after:

Bruecke. Dilute, boiled nitric acid is first added, then concentrated sulphuric acid.

Vitali. A few drops of potassium nitrite solution are added, then dilute sulphuric acid.

Masset. Concentrated sulphuric acid is first added to the urine, then a crystal of potassium nitrate; green streaks emanate from the fragments of the nitrite.

Fleischl. The urine is mixed with an equal volume of a concentrated solution of sodium nitrite, then a layer of concentrated sulphuric acid is added from below by means of a pipette.

Rosenbach. Nitric acid containing nitrous acid is added to the filtered urine.

Dragendorff, Deubner, filter through porous plate in place of ordinary filter-paper and then make the nitric acid test on the plate.

Hilger. The urine is treated with barium hydrate at a moderate temperature and the resulting precipitate, after being washed, is tested with nitric acid.

Godeffroy's reagent for alkaloids is a solution of antimony chloride. From aqueous hydrochloric acid solutions it precipitates aconitine, atropine, quinine, cinchonine, piperine, strychnine, veratrine in form of white or yellow precipitates. Caffeine and morphine are not precipitated.

Godeffroy and **Laubenheimer's** reagent for alkaloids is silico-tungstic acid, which produces sparingly soluble precipitates with the hydrochloric acid solutions of the alkaloids.

Gouver's solution for the detection of albumen is a solution of mercuric cyanide in an excess of potassium iodide. With albuminoids this solution produces a white precipitate.

Godbay's (also *Goadby's*) solution serves for the preservation of microscopic sections and consists of 120 g. sodium chloride, 60 g. alum, 0.25 sublimate and 2.33 liters of water.

Grahe's test for genuine cinchona barks. Genuine cinchona barks when heated in a test tube yield red fumes, whereas spurious barks produce vapors and tar of a brownish color.

Gram's dye for bacteria is prepared by shaking 15 drops of aniline with 15 g. water, filtering the solution and adding to the filtrate 4 to 5 drops of saturated alcoholic solution of gentian violet.

After the preparations are stained with the above dye they are brought into a solution of iodine in potassium iodide (1 g. iodine, 2 g. potassium iodide, 300 ccm. water) and then into alcohol. Certain bacteria (anthrax) retain the color, whereas others (cholera, typhus, Bact. Coli) are discolored.

Grandeau's reaction for alkaloids. To the solution of the alkaloids in concentrated sulphuric acid bromine water is carefully added. With some alkaloids it produces characteristic color reactions. Thus e. g. the solution of digitaline and digitaleïne in sulphuric acid is yellow, but becomes rose-red to violet through the action of bromine. Preparations of digitalis produce the same reaction. Morphine also produces a red color.

In place of bromine water *Dragendorff* employs a solution of bromine in potassium hydroxide or bromine vapors.

Greittherr's cocaïne reaction. If to a few drops of a cocaïne solution mixed with 2 to 3 ccm. chlorine water a few drops of 5 p. c. palladium chloride solution are added, a handsome red precipitate is produced, which is insoluble in alcohol and ether, but soluble in sodium hyposulphite solution.

(To be continued.)

MONTHLY REVIEW.

Commercial Reports.

East Indian Drugs.

Of interest to pharmacists are notes and descriptions drawn from a collection of East Indian drugs by Prof. Dr. Hartwich of Zurich, exhibited by Gehe & Co. in connection with the twenty-fifth German Apothecaries' Day at Dresden. These notes are here translated from the last number (September, 1896) of Gehe & Co's. Handelsbericht.

Acacia Arabica Willd. (**Mimosaceæ**). This tree is found in Africa, Arabia and India. Its bark, at present under examination, has had long recognition as valuable tanning material. Its tannin content is calculated at from 22 to 31 percent and is therefore very important. Like many other drugs containing tannin it is also used as an astringent tonic.

Anona squamosa L. (**Anonaceæ**). A native of the West Indies but cultivated every where in the tropics on acount of its palatable fruit, (Sweet-Sop, Sugar-Apple, *Pomme de Canelle*, *Caneel-Appel*, *Anon*). Besides the seeds, which we have before us, the leaves and bark are also used medicinally, the former as a sudorific, the latter as a drastic purgative. The seeds themselves certainly contain powerful principles; beside the oil in them, a resin has been found which either is itself the active principle or contains it. The infrequent notices so far made of it, set it down plainly as in part poisonous. At any rate it should be used with caution. Small particles getting into the eye produce pain and violent inflammation. The natives of India apply it as a remedy for head-lice.

The seeds of other species of *Anona* seem also to act similarly; as those of *A. muricata* L., *A. palustris* L., *A. spinescens* Mart., which are used to poison fish and to exterminate destructive insects. The seeds of *Anona squamosa* L. are from one to five cm. long; they grow to a length of eight mm. and to a thickness of five mm.; they are of a grayish-brown color, smooth, blunt at one end at which the small embryo lies in the cleft albumen. In the albumen are found numerous secretory cells; these are especially abundant at the circumference. According to Dymock (Pharmacographia Indica I, p. 44) the albumen contains abundant starch. In the seeds before us, that is not the case, nor is it so with those of the *Anona muricata* which we have examined for the sake of comparison. The endosperm contains fat and aleurone grains as reserve material. Either Dymock examined unripe seeds or he was deceived by the peculiar reaction of the cell walls. These become, with iodine alone, of a marked blue color and might therefore consist of amyloid or a nearly related modification of cellulose. The reaction is so strong that cross-sections treated with iodine and examined without the microscope might easily show a misleading resemblance to the starch reaction.

Andrographis paniculata Nees. (**Acanthacæ**). This annual is a native of India, Ceylon and Java. It is also cultivated and has been introduced in the West Indies and upon Mauritius. The whole plant and its watery extract are of an exceedingly bitter taste on which account it is often used in the same manner as gentian, quassia, etc. A careful examination of this undoubtedly valuable drug has yet to be made. Flückiger and Hanbury have only shown the absence of an alkaloid and the presence of a small quantity of tannin.

In case this drug should find consideration among us it should be remarked that many of the Indian names applied to it, as: *Kirya*, *Nila vembu*, *Nila veppa*, are also used for another plant, (the *Swertia Chirata Ham.* of the *Gentianaceæ* which furnishes the *Herba Chiratae*) which has likewise a bitter taste.

In order to be able also to identify *Andrographis* in a dwarfed condition, it would also be important to notice the crystallites of calcium carbonate appearing in the tissues and especially characteristic of many *Acanthaceæ*. In the leaves these are of a long cylindrical form. In the stem bark the same forms also appear being more of a roundish-oval.

Azadirachta Indica Juss., syn: *Melia Indica Brandis* (**Meliaceæ**). This stately tree, growing to fifteen meters high, is found wild and cultivated in India, Ceylon and the Malay Archipelago. Of its numerous Indian appellations the names *Nimb*, *Vembu*, *Veppam* and *Limbode* are given: from these most of the others are derived. Its English name is Indian Lilac. In India almost all parts of the tree are used for medicinal purposes, bark, roots, blossoms, leaves, fruit, a gum and an oil produced from the seeds. The bark of the trunk and boughs seems to be especially called in use (*Cortex Margosae*) as a tonic and antiperiodic. The root-bark, the leaves and the fruit are used as antihelminthic, the leaves also as a remedy in stone-in-the-bladder and syphilis. As to the ingredients to which its medicinal efficacy might perhaps be ascribed, we know very little. In 1856 Cornish found in the bark an alkaloid whose presence must, according to later accounts, be questioned. Broughton (1873) states that the acrid element of the bark is a resin.

The leaves of the plant and the root-bark lie before us. The leaf is pennate with terminal leaflet and with from nine to fifteen pairs of leaflets. The single leaflet is long-acuminate, dentate-sinuate. The taste is very disagreeable, nauseating, not bitter however nor slimy. The investigation of its structure has not brought to light any especially characteristic elements or cellular arrangements.

In the palisade cells of the upper surfaces, small oxalate concretions are found, around the vascular bundles, single crystals. The cells of the spongy parenchyma are on the under side rather closely set together and somewhat elongated, so that here a palisade tissue is formed, although little apparent. The vascular bundles show on each side a layer of fibres. The epidermis-cells of the upper side are often in considerable groups divided by transverse walls so that in areas a hypodermis is formed. Whether these cells contain mucilage could not be determined, since in order to render the tissues distinct very strong reagents must be used. In this connection it may be observed that the leaves occasionally occur among the Tinnevelly senna leaves. The root-bark consists of very fibrous pieces externally reddish-brown with yellowish-brown corky areas, internally whitish, obliquely striate. The whitish cross-section under the lens shows no brown spots. The bark tastes very bitter, gives with water a whitish extract which, it is worth while to note, contains no tannin. The inner bark has medullary rays two or three cell rows in width; the bast rays are plainly composed of alternating groups of fibres and interposed soft bast. The latter can be recognized by a narrow zone of grouped sieve-tubes in the middle of each layer.

Balanites Roxberghii Planch. The fruit finds in India manifold uses. When unripe it is regarded as an antihelminthic and purgative. The dose is about the half of the pulp of one fruit; in smaller doses it favors the excretions. As antihelminthic it is also much used for cattle. It contains a principle closely related to saponin to which its action is probably due. The ripe seeds contain about 50 percent of a fatty oil (Zachun oil) which is tasteless, of a yellowish color and bleaches easily in the sun. Spec. grav. 0.9185. It belongs to the slowly drying oils and in many directions resembles the arachis-oil, (peanut oil.) It is used for burning and in medicine externally on wounds.

Berberis aristata D. C. (**Berberidaceae**). English: Nepaul Barberry, French: *Vinettier aristé*. Our drug consists of rather small pieces of the bark, to 2 cm. wide and perhaps 1 to 1½ mm. thick, of marked yellow or, on the inner side, more of a blackish color. On the outer side, the pieces bear a rather soft cork while on the inner side, rather hard, sharply keel-shaped ridges run lengthwise. In cross section immediately under the cork, here consisting of thin-walled cells, there can be distinguished in the middle bark, crowded groups of stone-cells, then single groups of thick-walled, slender fibres and, toward the inside, lastly, a connected layer of stone-cells which also forms the keel-like projections. This striking structure becomes clear on comparison with pieces of the stem of the near relative, *Berberis Lycium*. The wood contains wide medullary rays which pass across into the bark. Into these rays, a sclerenchymatous ring lying in the bark sends keel-like projections which often reach into the wood and thereby split the medullary rays. The halves of the medullary rays thus formed run along on both sides of the keel. Thus in the cross section, from the sclerenchymatous ring and its projections, half circles are formed by the cambium and the adjacent wood. In these half circles lie the phloem bundles and a half of each of the two neighboring medullary rays. Both are thin-walled and in the dry drug so shrunken that externally to the cambium, a series of cavities is formed which lends to the drug a very characteristic appearance. In our specimen, the thin-walled phloem and the tissue of the medullary rays is lacking, having been rubbed away.

The drug contains 2.205 percent berberine. The other related alkaloids, oxycanthine and berbamine, occurring in the East Indian *Berberis* species, could not be with certainty identified, the quantity of the drug at our disposal being too limited.

From this species, as well as from *B. Lycium* Royle and *B. Asiatica* Roxb., there is prepared in India a bitter, astringent tasting extract of the consistence of opium known as *Rusot* or *Rasot*. This extract is said to be the *Lycium* of the ancients. Since this is so often adulterated in India, the bark is used in preference to it. The bark is used, apparently with success, as a febrifuge also for diarrhoea and dyspepsia. The barks find technical use for dyeing.

Butea frondosa Roxb. (**Leguminosae**). Of this plant we have the long known Bengal kino and the seeds. The seeds are found singly in the point of the leathery pod. This pod is flat at the bottom, wing-shaped, and indehiscent. The seeds are flat, reddish-brown, becoming 4½ cm. long, 3 cm. wide, kidney-shaped, or ovate, somewhat wrinkled. The raphe runs from the hilum, located on the concave side, half way around the seed and disperses in branches in the leathery seed coating. The seeds are reputed in India to be a good antihelminthic. The decoction of two or three seeds is regarded as a sufficient dose. They are also used in herpes, and with astringents and rock salt for cloudiness of the cornea. They contain 18.2 percent fat.

Cantharides, Indian. The beetles received by us are of a somewhat cylindrical form, black, with exception of the wing covers which are yellowish-brown with black transverse bands. They belong to the genus *Mylabris* which contains a whole series of vesicle-forming species. It is not improbable that the kind before us is of real value for the preparation of cantharidin, since many species of the genus contain much more cantharidin than our *Lytta vesicatoria*. Since it is, however, well known that by careless storage the cantharidin-content is much decreased, which is probably the case with the specimen at hand since most of the beetles lack abdomen and head, consisting, therefore, mainly of thoracic segments and the wings, a determination of the cantharidin was out of the question.

Cassia Abusus L. The seeds of this plant, extending as far west as Central Africa, have been used since ancient times especially in the treatment of eye troubles, in a manner similar to that in which the well known jequirity seeds or paternoster peas from *Abrus precatorius* are used. They are used alone as a fine powder, or with alum, sugar, lemon juice or lard or in an infusion. They are said to be especially effective in the Egyptian eye trouble. According to B. Schuchardt, their action is manifested most plainly in the limiting and removing of redness, looseness (Auflockerung) and granulation of the conjunctiva in blenorrhoea. The seeds are called *Cheshmat*, *Chashmizok*, *Schischen*, etc.

Celastrus paniculata Willd. (**Celastraceae**). This plant occurs in the East Indies extending eastward over the Sunda Islands as far as the Philippines. It is called in India: *Malkanguni*, *Gundumeda*, *Valuluvai* and *Ati-panch-cham*. The seeds are said to be a stimulating remedy. They are used as an aphrodisiac, also in rheum, gout, apoplexy, leprosy, etc. Often, instead of the whole seed, the fatty oil prepared from them, present to about 30 percent, is used. It is of a red color, due to the arillus enclosing the seed, and has a bitter taste. Mixed with benzoin, cloves, nutmegs and mace, an empyreumatic oil is obtained by dry distillation which is used in beri-beri.

Colchicum. Unfortunately, it is impossible to determine accurately the peeled corms before us. Corms of many species, in part growing in India, in part imported from without, from Afghanistan also from Western Asia are used medicinally in India. *Colchicum luteum* Baker, from Himalayas to Beluchistan, *C. speciosum* Stev., from Afghanistan, perhaps also *C. variegatum* L. from Western Asia may here be kept in mind. In the Indian bazaars, they go by the name of

Sarinjan. It is to be remembered that formerly in occidentalmedicine they played a rôle as *hermodactyli.*

Crinum Asiaticum var. **toxicarium** Herbert. (**Liliaceae**). This handsome plant with beautiful flowers is found wild in India and the Molukkas, and is cultivated as a favorite in Indian gardens. The bulbs principally find use, as in the specimen at hand, cut into narrow strips. They are used as emetic and diaphoretic. They are noted by Flückiger and Hanbury as a substitute for *Scilla.*

Datura alba Nees. (**Solanaceae**). This plant occurs in India and, on account of the beautiful flowers, is much cultivated, e. g. in Southern Europe. The leaves, roots and seeds are before us. With the much broken leaves are mixed a few unripe, roundish, spiny fruits and flowers 16 cm. long. The leaves contain calcium oxalate in glands, in the roots it is present as "Krystallsand," which is likewise the case with our *Datura Stramonium.* The seeds are larger than in our native species, yellowish-brown, flat, somewhat auriculate in form. The cross section usually shows, running near the edge, a pair of pronounced projections in which, as at the edge, the cells of the epidermis of the seed-covering are bulged outward. The seeds and leaves especially are used as medicine; their properties are narcotic, sedative and even hypnotic. They are said to be used in India to make people unconscious for criminal purposes.

In China, from this plant a poison, *Wan to lo hua* or *Nao yang hua*, is prepared, concerning which more is not known. We will not neglect to note that according to Hanbury (Science Papers, p. 258, 266) *Naou yang hua* is the name for a flower which, with aconite tubers, is made into a powder which, before operations, is used externally as a pain-reducing remedy. He expresses the conjecture that it is the flower of a *Rhododendron*, but notes that according to Horaninow the name is used in China for *Hyoscyamus.*

Since information concerning the constituents of the plant are completely lacking, it seemed advisable to carry out at least a preliminary investigation with the material at hand. Dr. Peinemann determined the alkaloid-content according to Keller's method as follows: Seeds, 0.541 percent; root, 0.315 percent; leaves, 0.41 percent. All are calculated with reference to atropine. By comparison with the extraordinarily varying data found in the literature concerning *Datura Stramonium*, it appears that *Datura alba* is richer in alkaloids than our native species. The alkaloid was obtained as a colorless varnish. Treated in the known manner with fuming nitric acid and alcoholic potassium hydroxide, it gave the violet color of atropine, likewise, according to Flückiger, with sodium nitrate and potassium hydroxide, with concentrated sulphuric acid, the characteristic odor was detected so that the identity of the alkaloid obtained with the so-called solanaceous alkaloids is not to be doubted. On the other hand, sulphuric acid in the cold gave a color reaction which atropine etc. do not show, in that the alkaloid at the first moment dissolved with a red color which soon passed over into orange and yellow. Perhaps the coloration belongs to the indifferent stramonine, discovered by Trommsdorff.

Garcinia purpurea Roxb. (**Guttiferæ**). This plant is indigenous to India and Indo-China. The sour-tasting outer covering of the fruit is especially used as a remedy for scurvy and the oil of the seeds, the *Kokum* or Goa-Butter (Indian, *Kokam cha tel Bhirandel* etc.) is also used. The seeds are from one to two cm. long, about one cm. broad, brown, kidney-shaped. The embryo contains in its cells besides crystalline fat characteristic aleurone grains and, in certain cells, tannin. (Compare Ueber den Bau des Samens: Chemiker-Zeitung [Cöthen] 1892 p. 1031.) The seeds contain about thirty percent of fat, of which, with the imperfect apparatus only about ten percent is obtained. It is quite hard, almost powdery, white or yellowish; later it takes on a brownish tinge. It has a faint odor; its taste is mildly oily becoming after a time rancid. It melts at from forty to forty-one degrees and contains glyceride of stearic acid, myristic acid, oleic acid and also free fatty acids. It furnishes a hard soda-soap. It is said to be used for the adulteration of melted butter. It is probable that the fat does not possess any especial medicinal qualities. It is used like cocoa fat and also as a substitute for cetaceum.

Helicteres Isora L. (**Sterculiaceæ**). This plant is found in East India and the Malay Archipelago both as tree and shrub and spreads even to North Australia. The mucilage-containing root is used like Althaea; its bark is valued in India as a remedy for diabetes. The follicular capsules, twisted spirally around one another, as they have come to us, are used for cramps in children. They appear now to have reached Europe in considerable quantities, (Compare Handelsbericht for April 1892, p. 3).

Kowli seeds. **Croton oblongifolium** Roxb., the seeds of which are used as a purgative and which therefore, according to Flückiger and Hanbury (Pharmacographia) occur as a substitute for the croton seeds of *Croton Tiglium* L., bears in India the name *Kuli.* However it is out of the question that the seeds before us come from this species the seeds of which are small. On the other hand, according to the description in Podromus these seeds easily correspond to those of *Croton oblongifolium* Tharactes (*C. persimilis* Müll. Arg.), and it is not impossible that a confusion of the two species, has been made. This might easily occur by reason of the present popular disregard in pharmaceutical and pharmacological books of the authors' names and the plant names.

The seeds reach a length of two and one tenth cm., a breadth of one and two tenths cm., a thickness of eight tenths cm., ovate, having pointed ends with a marked caruncle. The outer side shows the grayish brown crusty seed-coat with irregular rough longitudinal stripes; the cross-section shows a large endosperm, in the middle the embryo of considerable size with flat cotyledons.

Beside the fatty oil and protoplasm, the cells of the endosperm show longitudinally very large aleurone grains which contain a considerable number of small globoids and badly formed crystalloids.

(To be continued.)

Pharmaceutical Technique.

A New Rubber Stopper.

A rubber stopper with cap of the same material has been introduced by Richard Stiehler of Coeln a. d. Elbe and was recently exhibited at Dresden. Fig. a. shows the erect cap, fig. b. the same when drawn over the neck of the bottle. The stoppers are made of various sizes like ordinary rubber stoppers. It is recommended in all cases in which the ordinary stopper can be used and has the additional advantage of the caps, which are apparent from the accompanying cuts.

[Pharm. Centrh. 37, p. 613.]

Sterilization Apparatus.

Max Kaehler and Martini of Berlin have devised an apparatus for the sterilization of catgut and other substances which are to be sterilized in alcohol or another volatile liquid. The apparatus is comparatively simple and can be extemporized in any well equipped pharmaceutical laboratory. The substance to be sterilized is introduced into b (Fig. 1), the bottle placed on a wire netting in a water-bath and stoppered with a perforated rubber stopper, into the perforation of which the glass condenser d, e is inserted. In order to render the condenser less fragile it is made of two pieces. The thistle funneled top is covered with a watch-glass. The object of the perforated glass plate c is to prevent the rising water-vapors from heating the condenser. If organic preparations are to be sterilized in glass cylinders for exhibits, the cylinder is substituted for the bottle. In order to hold the cylinder firmly in position the water-bath is mounted by an inverted copper cone B (fig. 2). The details of the apparatus as well as the function of the various parts become apparent from the accompanying cuts.

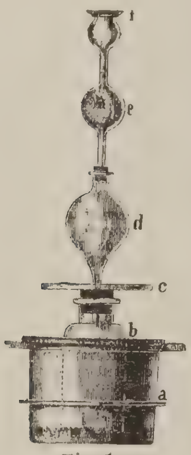


Fig. 1.

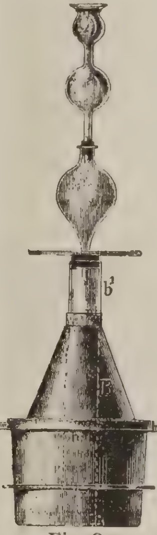


Fig. 2.

[Pharm. Ztg. 41, p. 614.]

Chemistry.

Potassium iodate-Starch Test-paper.

This is prepared by making a starch-paste from 2 g. of wheat starch and 100 ccm. water, adding 0.2 g. KIO_3, and saturating paper with the mixture. The dried paper is cut into strips which are used like similar test-papers. Traces of free SO_2 color the paper blue. To test for combined sulphurous acid the test-paper is first moistened with diluted hydrochloric acid (1:100). [Chem. Centr. B., 47^{II}, p. 513.]

A Bacillus as Pectin Ferment.

Winogradsky has communicated to the Paris Academy of Sciences the results of M. V. Firbes' researches in his laboratory at St. Petersburg upon the maceration of flax for the isolation of the fibres. The rotting is due to an obligate anaerobic bacillus, which acts not as a cellulose ferment, but as a pectin ferment. It dissolves the middle lamellæ of the cortical parenchyma, which consists of calcium pectinate and thus isolates the fibres.

[Botanical Gazette, 22, p. 182; from Compt. rend. 121, p. 742.]

Raphanol.

By distilling slowly the product of the maceration of roots of *Raphanus niger* in cold water, H. Moreigne has obtained a new volatile crystalline body which he calls raphanol. It is carried over along with essential oil from which it is separated by recrystallization from ether. The pure substance forms white, odorless, pearly microscopic crystals melting at 62°, insoluble in water, readily dissolved in ether and chloroform, also in the essential oil of raphanus, insoluble in alkali and in weak acids. When burnt, it was found to have the molecular formula $C_{29}H_{58}O_4$, which was confirmed by the cryoscopic method of Raoul. The general behavior of the body, determined as far as the small amount of material would permit, indicated that it is probably a lactone. The same body has been found by the author in other crucifers such as the red radish, turnip, long radish, water-cress and scurvy grass.

[Pharm. Journ. 56, p. 10; from Journ. d. Pharm. 57, p. 61.]

The Quantitative Estimation of Alkaloids.

On p. 21 mention is made of an earlier article on this subject by C. Kippenberger, which appeared in reprint form. The same author more recently contributed two lengthy articles on the same subject:—

1. Eine neue, für die analytische Praxis geeignete Methode der quantitativen Isolirung von Alkaloiden. The method is based on the ready solubility of the hydriodides of the alkaloidal superiodides in acetone, and conversion of the acetone solution into an aqueous solution of a salt of a mineral acid with the alkaloid.

2. Die Benutzung von Jodlösungen zum Zweck der titrimetrischen Werthbestimmungen von Alkaloidlösungen. This paper also is too lengthy to be abstracted and contains in form of a postscriptum a discussion of Gomberg's work, which together with other work along that line was summarized by Prof. Prescott on pp. 123, 148 and 172 of this journal. Those especially interested in this work will have to consult the original.

[Zeitsch. f. anal. Chem., 1896, pp. 407 and 422.]

Occurence of Quercetin in the Outer Skins of the Bulb of the Onion (Allium cepa).

It has long been a custom to use the outer dry skin of the bulb of the onion for dyeing Easter eggs; for this purpose the eggs are wrapped in the skins, the latter being kept in position by tying with thread or otherwise, after which the eggs are boiled in the usual manner. By this means a marbled or mottled pattern is obtained in various shades of brown, orange and yellow.

The effect thus produced seemed to indicate that onion skins probably contain a yellow adjective coloring matter towards which, in the custom alluded to, the lime of the egg-shell acts as a mordant. To test this point, a piece of ordinary striped mordanted calico was dyed for about ten minutes at a boiling heat with onion skins, when the aluminium mordant became a full bright yellow, the iron mordant a dark greenish olive.

According to Leuch's Farben- und Farbenkunde, 1, p. 434 (1825), the skin of onion bulbs were used at least provincially "in conjunction with alum, for dyeing wollen, linnen, and cotton matterials", a fact which had been forgotten.

In order to learn more about this coloring matter, and if possible to identify it, Perkin and Hummel have made a careful chemical examination of the substance.

The hot aqueous extract being strained through calico deposits the crude coloring matter upon cooling. It is purified by crystallization from hot alcohol, and by extraction of the ethereal solution by means of aqueous alkali. When pure, the glistening, yellow crystals have the composition $C_{15}H_{10}O_7$, form salts and with fused alkali yield protocatechuic acid and phloroglucinol. The dyeing properties with mordants point to the identity with quercetin.

It is interesting to note with regard to the quercetin group, that whereas fisetin is only known at present to exist in young fustic (*Rhus cotinus*), cuteolin in weld (*Reseda Cuteola*), morin in old fustic and jackwood (*Morus tinctoria* and *Artocarpus integrifolia*), and rhamnetin and rhamnazin in Persian berries, quercetin itself has a much more widely distributed existence. For instance, it has been found present in quercitron bark, Persian berries, catechu and in tea leaves; also in the bark of the apple tree and horse chestnut, and in numerous other natural products. This coincidence, however, may be more apparent than real.

[J. C. S. 69, p. 1290.]

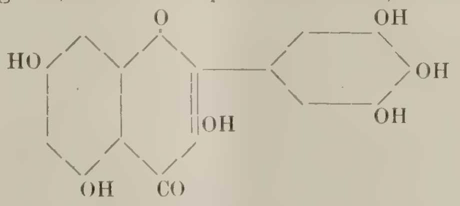
The Coloring principle contained in the Bark of Myrica nagi.

In the course of examining the tinctorial properties of some Indian dye-stuffs, the attention of Perkin and Hummel was attracted by the behavior of the bark of *Myrica nagi*. Not only did the coloring power compare favorably with that of such well-known dye-stuffs as old fustic and quercitron bark, but in some respects it seemed to differ from all other yellow mordant dye-stuffs. *Myrica nagi*, also called *M. sapida*, *M. integrifolia*, *M. rubra* etc., belonging to the Myricaceæ, is the box-myrtle or yangmal of China. It is an evergreen diœcious tree possessing an aromatic odor, and is met with in the subtropical Himalayas from the Ravi eastwards, also in the Khasi Mountains, Sylbet, and southward to Singapore, and distributed to the Malay Islands, China and Japan. The bark is said to have been exported from the North-West Provinces, Kumáon, etc., to other parts of India in recent years to the extent of about 50 tons per annum. In Bombay it is met with under the name of kaiphal, and is there worth 1—2 rupes per maund of 41 lbs, being entirely imported from Northern India. According to Mr. W. Coldstream it is used in Sirmur (Simla district) for dyeing pink, and also as a tanning agent for fancy leather work and for medicinal purposes.

The bark has an astringent taste, and in the powdered condition acts as an irritant on the mucous membrane of the nostrils, indeed it is said to be used occasionally as a snuff in catarrh with headache (Dict. of the Ec. Products of India, G. Watt, 5, p. 309.) The examination made by Perkin and Hummel seems to be the first chemical investigation of this bark.

Myricetin is prepared by exhausting the ground bark with boiling water. The coloring matter is precipitated by means of lead acetate, the lemon-yellow lead compound decomposed with boiling dilute sulphuric acid, and the brown liquid from which the lead sulphate has been removed is extracted with ether. The residue from the ethereal extract is taken up with a little alcohol and the alcoholic solution diluted with boiling water. Upon cooling the crystals separate. These are extracted with small quantities of boiling acetic acid to remove a colorless wax-like substance, and finally recrystallized from dilute alcohol. The yield averaged from 0.23 to 0.27 p. c.

The light yellow, glistening needles have the composition $C_{15}H_{10}O_8$ and melt above 300° with decomposition. Myricetin contains no methoxy groups, forms salts with one molecule of sulphuric or hydrohalogen acids, but hexa-acetyl and hexa-benzoyl compounds. The principal products of the action of fused alkalies on myricetin are gallic acid and phloroglucinol. Dissolved in carbon disulphide it adds four atoms of bromine at 100°. It therefore seems that myricetin belongs to the quercetin series, which contains a catechol nucleus, whereas myricetin contains a hydroxy catechol (pyrogallol) nucleus. The probable formula, therefore, is



The bark also contains 27.3 p. c. of tannin, absorbed by hide. It is also precipitated by lead acetate after precipitation of the coloring matter.

[J. Ch. Soc. 69, p. 1287.]

The Assay of Kola.

The following abstract is taken verbatim from a paper on the caffeine compound of kola presented at the Montreal meeting by A. B. Prescott and J. W. T. Knox.

Preparation of Sample. Slice a sufficient quantity of the fresh seeds in thin papery slices, allowing them to fall in a beaker of boiling alcohol. An ordinary potato slicer is a very convenient and effective instrument for this purpose. Remove the slices after a few moments boiling, and allow them to dry spontaneously on clean glass plates. Distill the alcoholic solution, under reduced pressure,* to a syrupy consistence, and pour it on the sliced drug now being dried, rinsing the flask with successive small portions of alcohol. When dry remove the drug to a mortar, wash the glass plates with a few cc. of hot alcohol, and pour this on the drug, which is to be finely powdered, and preserved in dry glass stoppered jars. The powder prepared in this way corresponds closely to the original color of the seeds, being but slightly paler in each instance. There can hardly be any doubt that it represents correctly the fresh seeds, with subtraction of the water, and perhaps of a portion of the trifling amount of volatile oil they contain.

For Free Alkaloids. Weigh accurately five grams of the sample, transfer to a Soxhlet's extraction tube, and treat for six hours, or until exhaustion is complete, with chloroform. Evaporate the chloroform, and to the residue add 30 cc. of hot one per cent. hydrochloric acid, and filter to remove fat, rinsing out the flask with several small portions of hot water, passing these through the filter, and washing the filter three or four times with hot water. The united filtrate and washings now amount to about 70—75 cc. Concentrate in a porcelain capsule on a water-bath to about 10 or 15 cc., transfer to a graduated cylinder, which has been carefully compared with the burette to be used for the Wagner's reagent, and rinse the capsule with three or four successive portions of hot water, making up the volume in the cylinder to 30 cc. after cooling. Now run in from the burette 30 cc. standard Wagner's reagent, and agitate well. Filter through asbestos after five minutes, and pour the filtrate into the same burette, previously washed and dried. About 55 cc. will be recovered. Run out an aliquot portion of the liquid (say 30 cc.), and neutralize the excess of iodin with decinormal sodium thiosulphate solution, then from the result calculate the number of cc. of iodin solution used. Multiply this number by 0.00485 for the weight of anhydrous caffein. With another aliquot portion of the filtrate make a duplicate titration.

It will be observed that the alkaloids are estimated only as caffein. Theobromin also is precipitated by Wagner's reagent, but its proportion, 1.48 to 100.00 of total alkaloids, is so small that the error introduced by the difference in the factors of the alkaloids is not appreciable.

For Combined Alkaloids. After the exhaustion with chloroform add alcohol of 90 per cent. to the drug, which is still contained in the extraction tube, and continue the treatment until exhaustion is complete, as shown by the absence of color in the portion of menstruum last siphoned over in the apparatus. Two or three hours are usually sufficient. This alcoholic solution may be treated in either of the following ways:

(*a*) Evaporate the solution to dryness in a tared porcelain capsule, and weigh. Take a small portion 0.200 or 0.300 gm.), and determine the amount of nitrogen by combustion. This nitrogen is entirely alkaloidal, as proteid substances are not extracted from the drug by the strong alcohol, and the total nitrogen can be calculated into caffein. From the amount of caffein found by combustion of the aliquot portion calculate the total amount present in the whole extract.

(*b*) To the hot alcoholic solution add an excess of freshly precipitated lead hydroxid (litharge or lead carbonate will not answer), and digest on a water-bath for a few minutes, until the supernatant fluid is colorless. Then transfer to a porcelain capsule, rinse the flask with hot alcohol, mix with clean white sand, evaporate the mixture to dryness, and place the whole in the extraction tube. Treat with chloroform three or four hours, and determine the caffein volumetrically.

A definite volume of Wagner's reagent of known strength is added in excess to the measured caffein solution slightly acidulated with sulphuric or hydrochloric acid, and the clear liquid is decanted off after the precipitate has settled or is filtered through asbestos after five minutes' standing. The excess of iodine is titrated with decinormal sodium thiosulphate solution, using an aliquot portion of the filtrate. From this the number of cc. of decinormal Wagner's reagent can be calculated, which number multiplied by .00485 equals the weight of the anhydrous caffein.

Botany and Pharmacognosy.

Crimson Clover Hair Balls.

Circular No. 8 from the Division of Botany, Department of Agriculture, reports a rather curious ailment in horses occasioned by eating too mature crimson clover. The barbed hairs of the mature calyx, by the action of the stomach, become matted together into the form of felt-like balls which set up in the stomach and intestine where they form and lodge violent and fatal troubles. As many as thirty such concretions have been found in the stomach of a single horse, and in size they may reach four inches. They are, of course, very light, a specimen four inches in diameter weighing less than five ounces. When once formed they act as obstructions in the alimentary tract and no remedy is suggested. By feeding the plant before these hairs become hard and stiff, no danger need arise from the use of the plant.

Poisonous Honey.

In a paper read before the American Pharmaceutical Association at the Montreal meeting, Mr. Lyman F. Kebler discusses poisonous honey. Poisonous honey has been known from ancient times and has been accounted for on very various hypotheses. Asia Minor has been the principal place of origin in the cases mentioned in literature, but the United States has not escaped. During the past year, New Jersey has furnished eight cases. Pennsylvania and South Carolina have also contributed. The symptoms agree in the main features. Dimness of vision, vertigo, delirium, pain in the stomach and intestines, purging and vomiting, retching and general symptoms of collapse are followed in the most severe cases by death.

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* The boiling alcohol kills the ferment and also dries the drug quickly. While it will appear later that this ferment, contrary to the general opinion, has but little if any influence on the production of free caffein from the caffein compound, the use of alcohol has nevertheless been retained as an efficient drying agent, and one that preserves the drug apparently without allowing any chemical change whatever to take place; the object being to avoid the decomposition of the caffein-bearing combination by the hot water remaining after the alcohol is evaporated.

The poisonous article is sometimes marked by a dark, reddish color and a somewhat repulsive odor; at other times neither in appearance nor in odor would it awaken suspicion. The examination of various poisonous samples has revealed the presence of toxic principles. In South Carolina, honey that proved fatal in three cases out of twenty was found to be highly impregnated with gelsemine.

Honey used by persons poisoned not long since at Princeton, N. J., was examined by Kebler who failed to find either alkaloids or inorganic poisons. Tests for andromedotoxin yielded uncertain results. It seems to be rightly suspected since it is widely distributed through the family of the *Ericaceæ* and is present in those plants that have been traditionally condemned by bee-keepers. *Kalmia latifolia, Andromeda* species, *Rhododendron* species and various azaleas contain this principle.

Although not positively established by the chemical examination, Kebler regards the flowers of the *Ericaceæ* as the probable source of trouble and bee-keepers are advised to avoid regions where these flowers abound.

Practical Pharmacy.

Skriptol.

A concentrated ink-extract prepared by Krueger in Goldberg. It is a tannin ink to which considerable dextrin and nigrosine have been added. Diluted with 20 to 25 parts of water it can be used as a writing or copying ink. The advantage of the concentration consists in the convenience with which large quantities of ink can be prepared. [Pharm. Ztg. 41, p. 573.]

Anti-Nausea.

Dr. Knoff in the Therap. Monatschr. warns against the use of this remedy, which is distributed on ocean steamers to passengers against sea-sickness. The tablets of which two to five are to be taken every hour are said to contain considerable cocaine, a fact that is manifested even by the local anaesthesia of the mucous membrane of the mouth.

[Pharm. Post. 29, p. 398.]

Mandl's Solution.

As a local anaesthetic for catarrhal mucous membrane Schech uses the three following concentrations of iodine-potassium iodide-glycerin:

Potassium iodide...	1.0	2.0	3.0
Iodine.....................	0.25	0.5	0.8
Glycerin..................	20.0	20.0	20.0

A few drops of phenol or peppermint oil are also added. The medicament is applied by means of a small brush.

[Pharm. Post. 29, p. 396; from Therap. M. Hft.]

Microbe mort.

According to the examination of Dr. Aufrecht of the Chem.-Bacteriological Laboratory of Berlin, the brownish-yellow liquid brought into the market under the above name by Read Holliday and Sons of Huddersfield is a mixture of equal parts of colored carbolic acid and glycerin.

The same firm advertises a medical toilet soap, which has a faint odor of carbolic acid and which proved to be a soda soap containing about 2 p. c. of crude carbolic acid. [Pharm. Ztg. 41, p. 573.]

Bases for Ointments.

The Phrm. Post publishes the following statement of composition of several preparations used as basis for ointments:

a) Adipatum. Anhydrous lanolin, 35 p.; yellow vaselin, 53 p.; white paraffin, 7 p.; distilled water, 5 p.

b) Epidermin. White wax, glycerin, mucilage of gum arabic and water, each equal parts.

c) Mollosin. Liquid paraffin, 4 p,; yellow wax, 1 p.

d) Ung. Lanolini. Anhydrous lanolin, 65 p.; liquid paraffin, 3 p.; white paraffin, 5 p.; distilled water. 30 p.

[Pharm. Post. Post. 29, p. 396.]

Literary.

Books and Pamphlets Received.

Lea Brothers & Co.—Philadelphia. A Manual of Materia Medica and Pharmacology. By David M. R. Culbreth, Ph. G., M. D. With four hundred and fortyfive illustrations. One vol., pp. XI, 818. 1896.

G. P. Engelhard & Co. — Chicago. The Standard Formulary. A collection of over four thousand formulas for pharmaceutical preparations, veterinary remedies etc. By Albert E. Ebert, Ph. M., Ph. D. and A. Emil Hiss, Ph. G, One vol., pp. 500. 1896.

A. Hartleben's Verlag — Wien. Allgemeine Waarenkunde. Handbuch für Kaufleute und Gewerbetreibende. Unter Mitwirkung von Fachgenossen, redigirt von Dr. Josef Bersch.

5. Lieferung: Eis — Fleischleim; pp. 193—240.

6. Lieferung: Fleischmehl—Gombofaser; pp. 241—288.

7. Lieferung: Gommeline—Hyalithglas; pp. 289—336.

8. Lieferung: Hyalophan — Kiefer; pp. 337—384.

Wm. Saunders, Director — Ottawa, Can. Appendix to the Report of the Minister of Agriculture. Reports of the staff of the experimental farms. One vol., pp. 426.

Deutsche Pharm. Gesellsch. — Berlin. Berichte über die pharmakognostische Litteratur aller Länder. Bericht für 1896. I. Theil. Pamphlet, pp. 58.

Schering & Glatz — New York. Silver and Silversalts as Antiseptics. Their bacteriological relations and their application in surgery. An address delivered before the d. Gesellsch. f. Chirurgie by Dr. B. Credé. 1896. Pamphlet, pp. 8.

A. Tschirsch—Bern. Ueber die Bildung der Kalkoxalat-Taschen mit besonderer Berücksichtigung offizineller Pflanzen. Inaugural-Dissertation zur Erlangung der Doktorwürde, vorgelegt der hohen philosophischen Fakultät der Universität Bern. Von Jacob Wittlin. Mit 1 Tafel. Separat-Abdruck aus „Botanisches Centralblatt", Bd. 67. 1896. Pamphlet, pp. 26.

—— Untersuchung über die Sekrete. Mitgetheilt von A. Tschirch.

18. Ueber das Sandaracharz. Von A. Balzer. Besonderer Abdruck a. d. Archiv. d. Pharm. 1896. Pamphlet, pp. 32.

19. Ueber das Palmendrachenblut. Von Karl Dieterich. Besonderer Abdruck a. d. Archiv. d. Pharm. 1896. Pamphlet, pp. 39.

—— Zur Chemie des Chlorophylls. Von A. Tschirch. Besonderer Abdruck a. Ber. d. d. Chem. Gesellsch. 1896. Pamphlet, pp. 5.

—— Ueber den Unterschied des echten und des giftigen Sternanis. Von Dr. Walter Laursén. Separat-Abdruck a. d. Schweiz. Wochensch. f. Ch. & Pharm. 1896. Leaflet, p. 4.

—— Untersuchungen über die Blattfarbstoffe und die Beziehungen des Chlorophylls zum Blutfarbstoff. Von A. Tschirch. Seperat-Abdruck a. d. Schweiz. Wochenschr. f. Ch. & Pharm. 1896. Leaflet, pp. 2.

Central Experimental Farm — Ottawa, Can. Flax. Bulletin No. 25, Department of Agriculture. By William Saunders, Director Experimental Farms.

Author — Phanerogams and Vascular Crytpogams of Australia. By Baron F. von Mueller and Prof. Ralph Tate. Reprinted from Trans. Roy. Soc., South Austr., 16. Pamphlet, pp. 50.

State Board of Health of Mass. — On the Prevention of Tuberculosis. By Jas. B. Russell, Senior Medical Officer of Health, Glasgow. Pamphlet, pp. 49.

Author — The Experience of Several Physicians with Sero-Therapy in Tuberculosis. By Paul Paquin, M. D. Reprinted from J. Am. Med. Assn. 1896. Pamphlet, pp. 19.

Author — The practice of pharmacy as a liberal profession. By Dr. F. E. Stewart. Reprinted from J. Am. Med. Assn. 1896. Pamphlet, pp. 19.

Author — The eminently scientific nature of our patent and copyright laws. The Klebs antiphthism case. By Dr. F. E. Stewart. Reprinted from J. Am. Med. Assn. 1896. Pamphlet, pp. 11.

Gehe & Co. — Dresden. Verzeichniss neuerer Heilmittel, mit kurzer Bemerkungen über Herkommen, Zusammensetzung und Wirkung. Pamphlet, 20. 1896.

Reviews.

Friedrich Mohr's Lehrbuch der chemisch-analytischen Titrirmethode. Von Dr. Alexander Classen, Professor der Chemie an der königl. technischen Hochschule, Aachen. Siebente umgearbeitete und vermehrte Auflage. Ein Bd., pp. XVIII, 906. Mit 191 eingedruckten Holzschnitten. Druck und Verlag von Friedrich Vieweg und Sohn, Braunschweig. 1896. M. 35.00.

It does not often happen in this quicklived scientific century that a text-book passes through new editions forty years after the appearance of the first edition, and continues to bear the name of the original author almost two decades after his death. Yet this is the case with the book before us.

Gay-Lussac had worked out his chlorimetry in 1824, alkalimetry in 1828, the determination of silver in 1832, but in spite of their usefulness these methods found but little favor. The use of the permanganate solution for the determination of iron by Marguerith in 1846, and the application of the iodine and sulphurous acid solutions by Bunsen are also milestones in the history of volumetric analysis and assisted materially in placing this important branch of chemical analysis on an equal footing with gravimetric analysis. However, there was little or no system in this important field. Each investigator had adopted arbitrary strengths for his solutions, so that in most instances they bore no relation to each other. To have brought order into this chaotic condition is the desert of Friedrich Mohr, who systematized what was already known, expanded and enlarged this system after it was once established. The results of his labors were given birth in his Lehrbuch der chemisch-analytischen Titrirmethode, published by Friedrich Vieweg und Sohn in 1855.

The fact that the book has been published by the same firm lends a great deal of semblance to the various editions. This can be traced even to the cuts of the first edition, many of which appear again in the latest. That these cuts should have suffered in distinctness by age and continued usage does not seem to detract from the bookmanship, but gives to the latest edition an historic charm that is worth more than perfection of a wood-cut.

Although the general character of the book is much the same there have been numerous changes. These do not become apparent only in new chapters or parts of chapters or the absence of old ones, but in one instance at least in entirely different treatment of the subject matter. The chapter on indicators has been taken from its empiric and has been placed on a more scientific basis, so well presented in Ostwald's Die wissenschaftlichen Grundlagen der analytischen Chemie.

In order to make possible the addition of new methods without materially increasing the volume of the book, the chapters on technical gas analysis, beer, wine, milk, soft coal and peat, which did not at all belong to the domain of volumetric analysis, have been omitted. In order to secure the services of Professor Classen, who had revised the sixth edition, for the revision of the seventh, the publishers have been constrained to raise the price from M. 20.00 to M. 35.00. This may seem unfortunate, yet the value of the book is such as to warrant the increase. The name of the publishers are sufficient guarantee for excellent paper, cuts and press work. *E. K.*

Die verbreitetsten Pilze Deutschlands. Eine Anleitung zu ihrer Kenntniss. Von Prof. Dr. Otto Wünsche. Druck und Verlag von B. G. Teubner, Leipzig. Ein Bd., pp. 112. 1896. M. 1.40.

The object of the author in this small volume is to make the identification of the larger fungi of Germany possible to those who lack technical botanical knowledge. To that end he considers only the most widely distributed forms of the *Myxomicetes*, *Ascomycetes* and *Basidiomycetes*. The body of the book is a descriptive key to the species in which characters of the fruiting body only are used. The descriptions are condensed and put in simple language. A key to the larger groups and a few of the genera, based on the form of the fruiting body; and another to the genera of the *Agavicaceæ* based on habitat add much to the usefulness of the book.

The mechanical work is good in every respect. In its flexible cloth binding, with light paper and good print, all at a very moderate cost, this little volume may become a useful companion to all who are interested in the identification of the more common fungi of Germany. *L. S. Cheney.*

A Manual of Materia Medica and Pharmacology comprising all Organic and Inorganic Drugs, which are and have been official in the United States Pharmacopœia, together with important allied species and useful synthetics, especially designed for students of pharmacy and medicine as well as for druggists, pharmacists and physicians. By David M. R. Culbreth, Ph. G., M. D., Professor of Botany, Materia Medica and Pharmacognosy in the Maryland College of Pharmacy. With four hundred and forty-five illustrations. Lea Brothers & Co., Philadelphia and New York. 1896. pp. 818.

As one looks over the output of new text-books during the last few years, he is immediately struck by the attention bestowed on materia medica and pharmacognosy. That a general dissatisfaction with the state of school literature on these subjects exists among instructors, seems to be shown by the numerous attempts to contribute to its improvement. Standing as these branches do at the point of meeting of several roads, chemistry, botany and zoology among others, it is difficult to give these that unity and coherence which makes a subject a thorough satisfaction to teach. With no thread of argument connecting the facts to be presented, they appear merely as disconnected data to be memorized by "main force." This is the light in which the majority of text-books on the subject present the matter; merely a collection of loose facts to be transferred with the utmost expedition to the pupil's memory. Probably at present this style of book is the one most useful, since the preliminary training in the tributary branches is not comprehensive enough to enable the student to connect in any appreciative way these isolated facts with the general subjects to which they stand in relation and a general view of the situation is impossible.

This will remedy itself, we are sanguine enough to hope, as the required preliminary training is increased. Then another kind of text-book in materia medica and pharmacognosy will have a mission, perhaps even now might be used in some instances with profit. But that ideal book has not yet been written.

In the stout octavo volume before us we have a work meant to supply the demand not only for a book useful in the class-room but also for a compendium for the practical use of the modern druggist. All drugs, official now or formerly, are considered. If no longer so, the period during which they were official is given, a bit of information often useful. Drugs from allied species are briefly treated. The most important synthetic compounds as well as the usual inorganic drugs of the pharmacopœia are concisely considered. A chapter on the microscope and its use in materia medica gives brief and valuable directions. An appendix includes a list of poisons and andidotes; rules for converting various units into those of other denominations; a table grouping the leading organic drugs according to their most important constituents; a table of maximum doses; and a list of popular medical abbreviations.

According to the preface, drugs of vegetable origin are taken up according to the natural order of plant classification. The system of Bentham and Hooker has by "a few interjected modifications" been brought into close conformity with Gray's Manual of Botany, and the Coniferæ are "interjected" between the Dicots and Monocots. The wisdom of following a system already regarded by botanists as outgrown and antiquated when the arrangements of either Eichler or Engler and Prantl would have helped to bring the far more natural order before the pharmaceutical students of this country, is open to serious question. That more students are familiar with Gray's Manual than with any other and, therefore, with the unnatural order there adopted, is doubtless true and perhaps this system therefore commends itself for convenience sake. But, in the opinion of the reviewer, to allow the plea of convenience to retard the adoption of modern ideas is giving it in this case too high a consideration. Convenience, solely, is again consulted when doses are given in the apothecaries system and temperatures in Fahrenheit degrees.

The treatment of the various individual drugs is concise. Besides the usual features, the derivation of the botanical names is given and their syllabic accent indicated. Adulterations are briefly described and the chemical constituents are made prominent. The preparations, properties and uses, as well as occasional commercial and historical information of especial interest, receive attention. The inorganic drugs from the mineral kingdom are treated in much the usual manner. The method of manufacture, tests, assays, preparations, properties and uses are given. Organic carbon compounds are likewise taken up, structural formulas and reactions receiving attention. An abundance of good illustrations, some already familiar in other text-books, some new in a work of this kind in this country, add very materially to the value of the book.

All things considered, in spite of those features which the reviewer must beg to question, this is for students in pharmacy schools and as a reference work of limited capacity (it being no competitor with the dispensatories) perhaps the most available work that has come to our notice. By the use of good paper and type the publishers have contributed materially to the value of the book.

Rodney H. True.

The Standard Formulary. A collection of over four thousand formulas for pharmaceutical preparations, family remedies, toilet articles, veterinary remedies, soda fountain requisites, and miscellaneous preparations especially adapted to the requirements of retail druggists. By **Albert E. Ebert**, Ph. M., Ph. D., and **A. Emil Hiss**, Ph. G. One vol., pp. 500. **G. P. Engelhard & Co.**, Chicago. 1896.

The favor which Hager's and Dieterich's manuals have found in this country, the sale of the National Formulary of the American Pharmaceutical Association, the space which pharmaceutical journals give to the publication of formulas all indicate the importance of formularies to the practicing pharmacists. However, Hager's and Dieterich's manuals are not only printed in German, but are especially adapted to the German trade. The National Formulary is on account of its very nature as a supplement to the Pharmacopœia limited in its scope. The journals, although they are in a position to publish the most recent formulas, are rather cumbersome for future reference and do not contain their information classified. Furthermore their information is rather that of the copyist and compiler than that of the person who knows himself from experience what the value of a new or even an old formula may be.

It would seem, therefore, that a deficiency existed in American pharmaceutical literature. Whether this gap has been filled by the new formulary before us time alone can demonstrate. It does not only not fall within the province of a review to criticize the individual formulas of the book, but it is an impossibility for the writer as well as for any other person to undertake such a work satisfactorily without making the preparations and putting them to the test of time. To peruse the pages until a few typographical or other errors have been found the writer will gladly leave to others.

As to the general character of the book, it makes on the whole a favorable impression. This might be expected especially from the senior author with his thorough chemical and pharmaceutical training and long years of experience as a practicing pharmacist, who is wide awake to the everyday needs of his calling.

The title gives sufficient indication of the content. The various parts and chapters are as a rule prefaced by a short introduction. In taking from Dieterich and Hager as well as from the various pharmacopœias and formulas what was thought needful and best, the authors have adapted these formulas to the conditions and customs prevailing in pharmacy of this country. If in this adaptation the authors have accommodated themselves to the extent of using the old system of weights and measures rather than the metric system, for the universal adoption of which they as well as all enlightened pharmacists are no doubt striving, we may be persuaded to forgive them sooner than most other writers of books. This book is not at all intended as a text-book as most treatises on pharmaceutical subjects primarily are, but as a laboratory manual for today's practicing pharmacists, most of whom know little or nothing about the metric system and mostly have no metric set of weights and measures to work with. It is unfortunate that this should be, and it is to be hoped that if this new formulary finds favor with the American druggist, a future edition may aid in advancing the cause of the metric system in this country, rather than in retarding its cause by accommodating itself to the convenience of the lazy and ignorant. The presswork is neat and should be commended.

E. K.

Zeitschrift für Angewandte Mikroskopie. Herausgegeben von **G. Marpmann**. Erster Band. April 1895 bis April 1896. Leipzig. Verlag von **Robert Thost**. M. 7.00.

In view of the increased significance of the microscope in so many directions in the last few years, it was believed that the times were ripe for a periodical devoted to the microscope and to microscopic technique. This journal, appearing monthly, was intended as a central organ which should take cognizance of all articles bearing on the whole subject of microscopy. This proving impossible because of the limited size of the periodical, it seemed best during the current year and thereafter, to give especial attention to the practical phases of the subject, with particular reference to the microscopic investigation of food stuffs, drugs, pathological products and similar objects as well as methods of preservation and preparation of materials for scientific study. Thus the initial volume, in the nature of its contents, differs somewhat from the current volume.

Original articles from the various departments of science in which the microscope is used, abstracts of articles from many sources, descriptions of new apparatus, book reviews and a list of the new literature are among the features of volume one. Among the articles of the year, there are many of interest to pharmacists. This periodical bids fair to be of service to pharmacy in the particular province of drug investigation and should be available to all working with the microscope along these lines.

As a supplement, there has been continued throughout the year, from four to fifteen pages per number, an alphabetical lexicon of applied microscopy. Words from the most varied sources are here very briefly defined. In Vol. 1, forty-eight pages of this lexicon appear, including the letter A.

Rodney H. True.

Berichte über die Pharmakognostische Literatur aller Landen. Herausgegeben von der **Deutschen Pharmaceutischen Gesellschaft**. Bericht für 1896, I. Theil. Pamphlet, pp. 58, 1896.

As announced in the Proceedings of the German Pharmaceutical Society (V, 1895, p. 186) a pharmacognostical commission of this society has undertaken the collection and publication of abstracts of the new literature bearing on the investigation of medicinal and otherwise useful plants as well as poisonous species. The first part including the articles which have appeared since the beginning of 1896 has appeared. The abstracts are numerous and to facilitate reference are grouped under appropriate headings giving a great amount of information in compact form.

Rodney H. True.

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EDITORIAL.

Schein und Wirklichkeit in der beruflichen und wirthschaftlichen Stellung der deutschen Pharmacie.[1]

Die öffentliche Meinung über die Verhältnisse der Pharmacie und über die Solidarität des Apothekerstandes in Deutschland fusst im fernen Auslande noch immer recht sehr auf den Traditionen der "guten alten Zeit", das heisst während der ersten Hälfte dieses Jahrhunderts. Gehört doch noch heute der kleine Ueberrest derjenigen älteren Veteranen der deutschen Pharmacie, welche derselben im Auslande durch Berufstüchtigkeit und Charakter hohes Ansehen und Geltung erworben haben, der um und nach der Mitte dieses Jahrhunderts stattgehabten Auswanderung an. Mit dem Abtreten jener in strenger Schulung zur Meisterschaft gereiften Repräsentanten der Blüthezeit der deutschen Pharmacie sind freilich auch die alten Ideale im Auslande und vor allen in den Vereinigten Staaten mehr und mehr verbleicht, der Nachschub der Auswanderung hat sich längst als weit minderwerthig erwiesen und das in der Pharmacie Amerika's früher dominirende Deutschthum hat die ehedem massgebende Stellung und Geltung almälig verloren. Der einstige Nimbus der "deutschen Apotheke" ist visionär geworden, indessen die Mythe von der unter staatlichem Schutze in behaglicher Sicherstellung und in opulenter Prosperität gedeihenden deutschen Pharmacie besteht unvermindert fort und gilt dieselbe in der Ferne noch immer vielfach als das beneidenswerthe Abbild pharmaceutischer Vollkommenheit und Glückseligkeit. Auch für diese Illusion gilt wohl das Dichterwort:

> "Was vergangen kehrt nicht wieder,
> Sank es leuchtend nieder,
> Leuchtet's lange noch zurück."

In Wirklichkeit aber beruht das grosse Prestige, welches die deutsche Pharmacie im fernen Auslande noch fort und fort behauptet, längst nicht mehr in der deutschen Apotheke, sondern in der, neuerdings meistens ausserhalb derselben, wirkenden und leistenden wissenschaftlichen Vertreter derselben. Der noch unverwelkte und sich stetig verjüngende, reiche Blüthenkranz der deutschen Fachliteratur überglänzt in die Ferne hin noch immer das grosse Substrat des vielfach in Frohndienste des Kapitals und der Gläubiger vegetirenden Contingents der deutschen Apotheker und des auf dem Vulkane illusorischer Privilegienwerthe in wirthschaftlicher und gewerblicher Misere stehenden Apothekerstandes. Diesen und dessen Existenzkampf um gedeihlichen Fortbestand des von allen Seiten bedrängten und eingeengten Apothekergewerbes übersieht man in der Ferne über die schönen Früchte, welche das Füllhorn der deutschen Fachliteratur und die stille Arbeit der deutschen Universitätslehrer fort und fort in die Welt hinaussenden.

In den Bänden dieser Zeitschrift sind die traditionellen idealen Seiten der deutschen Pharmacie, zuweilen mit mehr Pietät als der Wirklichkeit entsprechend, immerdar hoch gehalten und gepriesen, und die Kehrseite der Medaille und die Realität weniger in Betracht gezogen worden. In dem Oktoberhefte des Jahres 1895 (S. 227) ist indessen die derzeitige gewerbliche und wirthschaftliche Lage des deutschen Apothekerstandes einmal in Kürze in Betracht gezogen worden. Es wurde darüber unter anderem gesagt:

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[1] On account of the direct bearing the above editorial has upon pharmacy in Germany it is published in the German language. Inasmuch, however, as it contains considerable of interest to the American pharmacist, an English translation will appear in the December number. Space does not permit of the publication of both German and English in this issue. *E. K.*

"Der besitzende, vielfach tief verschuldete Theil des deutschen Apothekerstandes strebt nach dem Fortbestande, oder der Ablösung der überkommenen Gerechtsame und Monopolwerthe, ergiebt sich sonst aber mit Resignation in die derzeitige, allem Anscheine nach der Niederlassungsfreiheit zutreibenden Strömung." "Die Unsicherherheit und der langjährige Druck auf die Lebenselemente der deutschen Pharmacie sind aber auch auf den Fortbestand der beruflichen und wissenschaftlichen Interessen und Leistungen nicht ohne Rückwirkung geblieben. Die sprichwörtliche Lust und Liebe zu reger wissenschaftlicher Fortarbeit scheinen sich weniger als ehedem ein Gemeingut des Apothekerstandes geblieben zu sein. Der harte Kampf um Erwerb und für den Bestand des Erworbenen, oder für die Verzinsung übermässiger Hypothekenlasten erfordert mehr mercantilen Geschäftsbetrieb, drängt die Neigung und das Streben nach idealeren Gütern und den einstigen, gepriesenen "Wissenschaftsgeist" des deutschen Apothekers auf den Gefrierpunkt herab, und schafft und vermehrt ein Epigonenthum. Auch der deutsche Apothekerstand zehrt wirthschaftlich recht sehr von der Hand zum Mund, und beruflich von dem Ruhme einer lebensfrischeren und leistungsreicheren Vergangenheit."

Die Verkäuflichkeit der einstigen Privilegien und Concessionen zum Apothekerbetriebe hatten Idealwerthe und Monopole geschaffen, welche schliesslich illusorische Kaufobjecte wurden, und den sogenannten Apothekerschacher herbeiführten, welchem Uebel bei sehr ungleichartiger Interessennahme der Staat, der Reichstag, der Socialismus, einstweilen noch machtlos, gegenüberstehen. Andererseits aber ist die einstige Opulenz der auf eine gewisse Bewohnerzahl begrenzten Apotheken durch die Freigabe des Handels einfacher Drogen und arzneilich oder technisch gebräuchlicher Waaren beträchtlich vermindert, denn es entstanden fortan neben den Apotheken die Drogisten-Geschäfte und deren Zahl ist im Laufe der Jahre so gewachsen, dass zur Zeit auf jede Apotheke im Durchschnitt etwa drei Detail Drogisten Läden bestehen.

Ein anderer Incubus, welcher der amerikanischen Pharmacie fast unheilbare Krebsschäden gebracht und sie mehr als jedes andere Uebel geschädigt hat, ist auch in die deutsche Medicin und Pharmacie eingezogen,—das Geheimmittelunwesen. Dieser uralte und unverwüstliche Missbrauch des Arzneiwesens, welcher auf dem Boden der Habsucht, des Wunderglaubens und der Leichtgläubigkeit der Menschen, wenig vermindert, um in anderen Formen und in modernerem Gewande immerdar fort zu gedeihen scheint, hat auch in die deutsche Apotheke die gleichen Keime der Corrumpirung und der Decadenz gebracht, welche in der amerikanischen Pharmacie so viel Unheil angerichtet und so tiefen Verfall herbeigeführt haben. Dort wie hier aber trägt in dieser traditionellen und wunderbarsten Entartung des Arzneiwesens keineswegs die Pharmacie alle Schuld. Das Wesen der "Volksmedicin"[2] in ihren verschiedenen Stadien, Gestaltungen und Verirrungen ist mit dem Mysticismus von Alters her als ein dunkler Schatten durch die ganze Culturgeschichte wahrnehmbar. Sind auch die Illusionen und die Glaubenssätze des Zeitalters der Adepten und der Iatrochemiker dem Wandel alles menschlichen Irrens und Fehlens anheimgefallen, und hat sich der Arzneischatz auch so manchen wunderlichen und widerlichen Ballastes entledigt, und die Arznei- und Heilkunst vermeintlich gründlich reformirt und geläutert, so bestehen dessen ungeachtet der alte Aberglaube und der stereotype Wunderglaube in alle möglichen Heilmittel, Heilmethoden und Heilkünstler, man mögte fast sagen, instinctiv und mit unverminderter Zuversicht fort. Trotz der viel gepriesenen Höhe des ärztlichen Wissens und Scepticismus, und trotz aller wirklichen oder vermeintlichen Aufklärung sind auch neben dem modernen, wissenschaftlich getauften Specialitäten die alten Geheimmittel gangbare Handelsartikel in deutschen Apotheken verblieben oder geworden, und das keineswegs selten durch die Vermittlung und unter der Aegide von Aerzten, wie das im Auslande eine längst bestehende und die Pharmacie so tief schädigende Erfahrungssache ist.

Indessen ist dies nur eins der vielen und vielleicht nur ein sehr untergeordnetes Element, welche die derzeitige Reformströmung des deutschen Apothekenwesens zur endlichen Lösung drängen. Diese geht vor allem dahin, der seit langer Zeit progressiven Speculation in illusorischen Werthobjecten der Apothekenprivilegien und Concessionen Einhalt zu thun. Die chronische Sentimentalität der dabei in Betracht kommenden Factoren scheint vor der Macht der Thatsachen und der Realität an der Grenze des "*lex talionis*" angelangt und damit Aussicht zu sein, dass dieses Schmerzenskind des deutschen Apothekerwesens auf seiner national-ökonomischen und financiellen Grundlage endlich einmal *brevi manu* aus der Welt geschafft werde. In dieser Richtung haben die früheren und die derzeitigen Reformvorschläge für das Ausland geringes Interesse und keinen praktischen Werth. Die Missstände, welche den gedeihlichen Fortbestand der Pharmacie gefährden, oder an derem langsamen Verfall mitwirken, sind wohl überall die ähnlichen, nur greift in Deutschland der Staat als controllirender Factor in den gewerblichen Betrieb und Bestand der Apotheken gebieterisch ein, während diese und das Geschick der Apotheker in den Vereinigten Staaten lediglich dem Unternehmungssinne der Leistungskraft und der Willkühr des Einzelnen, und dem natürlichen Verlaufe jeden Unternehmens im Handel und Wandel überlassen bleiben.

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[2] Pharmaceutische Rundschau, 1891, S. 151.

Von Interesse aber dürfte es sein eine Anschauung darüber zu gewinnen, wie wohl, oder wie wenig gerüstet der deutsche Apothekerstand in die ihm offenbar nahe bevorstehende Alternative einer wirthschaftlichen Reform eintritt. Dafür gewährt die kürzlich erschienene Schrift eines im preussischen Staatsdienste stehenden Arztes eingehende und gewiss vielfach überraschende Auskunft. Es ist dies dies die von dem Medicinal Assessor Dr. Springfeld in Berlin verfasste Brochüre *"Zur Entwicklungsgeschichte der Apothekenreform"*[3]. Die durchweg objectiv und offenbar mit voller Sachkenntniss entworfene Schilderung der derzeitigen deutschen Apothekenverhältnisse gewährt unter anderem auch ein klares Bild über die Gefahrenheit und über Symptome eines Verfalles, welche in den verschiedenen Schichten und Schattirungen der besitzenden, wie der conditionirenden, oder in andere Berufs- und Gewerbezweige übergegangenen Pharmaceuten zu bestehen scheinen. Die Schrift bekundet ferner die jedem sachkundigen Ausländer unverkennbare Thatsache, wie sehr sich die deutsche Pharmacie und deren Schwester, der Detail-Drogistenbetrieb, amerikanisirt haben und wie auch diese, nicht minder wie ihre amerikanischen Prototypen, auf hohlem Boden stehen und an ähnlichen Uebeln kranken. Dies ergiebt sich, nicht ohne Belehrung und Warnung auch für die amerikanische Pharmacie, aus den folgende fragmentischen Citaten aus der genannten Brochüre:

"Seit der Loslösung der Chemie von der Pharmacie und der Centralisirung des grössten Theiles der Arzneimittelproduction in der Hand der pharmaceutisch-chemischen Grossindustrie hat sich die Thätigkeit des Pharmaceuten aus den wirthschaftlichen in die mercantile umgewandelt. Aus dem gelehrten Apotheker früherer Zeit wurde ein Zwischenhändler. Selbst die Receptarbeiten wurden eingeschränkt und verloren an wissenschaftlichem Werth, als es der Grossindustrie gelang dispensirfertige dosirte Arzneiformen von fast unbegrenzter Haltbarkeit herzustellen. Der dispensirende Apotheker ist damit vielfach Automat und die deutsche Apotheke zur Heranbildung von Lehrlingen unzureichend geworden."

"Um dem immer mehr den Gelehrtencharacter verlierenden Stande das Ansehen früherer Jahre zurückzugeben, wurde von den Apothekern die Unterrichtsfrage auf die Tagesordnung gesetzt und insbesondere das Maturum verlangt. In einer Zeit, indessen, in der der Beruf immer mehr technische und commercielle Prägung gewann, in welcher seine Ausübung eine immer einfachere, weniger wissenschaftliche wurde, in welcher die deutsche Apotheke immer unfähiger zur Heranbildung des Nachwuchses wurde, war eine solche Forderung um so ungerechtfertigter, als die gesellschaftliche Gleichstellung mit den gelehrten Berufsarten nicht durch das Maturum und das Universitätsstudium an sich, sondern durch die spätere berufliche Thätigkeit bedingt wird. Damit wäre eine Ueberfüllung des Standes wohl beschränkt, indessen auch ein weit unbescheideneres geistiges Proletariat und zu manuellen Leistungen ungeschickteres Personal geschaffen worden. Man gieng noch weiter; die Apotheker strebten darnach, ein Stück der immer mehr Geltung gewinnenden Hygiene sich zu erobern. Die Apotheke sollte ein hygienisches Institut werden, in welchem die auf chemischen oder bacteriologischen Untersuchungen fussenden Diagnosen des Arztes und des Hygienikers gestellt werden, der Apotheker also ein "Berather des Arztes" sein könne. Die Wissenschaft der forensischen und der Nahrungsmittelchemie sollte Leben in die stillen Apothekenlaboratorien zurückrufen, die Beruffreudigkeit und das Ansehen des Apothekers heben. Es waren die alten Träume, von denen die Apotheker nicht lassen können."[4]

"Gegen die im eigenen Lager immer mehr einreissenden Schäden thaten die Apotheker nichts mehr. Seit dem Tode des vieljährigen verdienten Vorstehers des deutschen Apotheker Vereins, Dr. Brunnengräber's[5] war auch die Tactic der deutschen Apothekervereine eine andere geworden. Früher focht man mit Gründen und kam mit positiven Vorschlägen, jetzt werden nur Reden gehalten. Früher konnte ein Andersdenkender mit Genuss lernen von den sachlichen Ausführungen der Apothekervereine; jetzt wendet sich mancher Gesinnungsgenosse ab von dem wüsten Geschrei und von der besonderen Art der richtigen Agitation, die mit Hilfe eines eigenen Agitationsfonds betrieben wird, von den Audienzen, der Prahlerei, der Beeinflussung der Presse und der Abgeordneten, von dem System persönlicher Verdächtigung, der Geringschätzung der Person des Gegners, und *last, not least* von den hierarchischen Bestrebungen des Vereinsvorstandes."

"Die mit dem Rechtsbewusstsein des Volkes und mit der Reichsgewerbeordnung im Widerspruch stehende Verkäuflichkeit der Apotheker-Concessionen hat zur Entstehung von Idealwerthen und zur Verschuldung der Apotheken geführt, das Selbstständigwerden unbemittelter Pharmaceuten verhindert und früher wohlhabende Apotheker zu Vasallen ihrer Gläubiger erniedrigt. Der Geist des Mercantilismus wurde in die Apotheken getragen, ein für ordnungsmässigen Betrieb zu schneller Besitzwechsel trat ein, Geheimmittelschwindel, Kurpfuscherei, Lehrlingswirthschaft, Betriebsunsicherheit waren zu beklagen."

Wenn Dr. Springfeld den Apothekern die Schuld für den Einzug der Geheimmittel und Specialitäten in die deutsche Apotheke allein vindiciren möchte, so ist schon einleitend erörtert worden, dass der Fortbestand dieser Gestaltung oder Entartung des Arzneiwesens ausserhalb der Controlle der Medicin und der Pharmacie, ja des Staates steht. So lange das Arzneiwesen noch den Nimbus des Mysteriösen trägt und mit der Heilkunde noch im Stadium empirischen oder wissenschaftlichen Experimentirens beharrt, so lange werden Aberglaube und Wunderglaube für die wirklichen oder vermeintlichen Heilmittel und Heilmethoden schwerlich aus der Welt geschafft werden können.

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[3] Pamphlet. 83 Seiten. Verlag von Georg Thieme in Leipzig. Preis 35 Cents. 1896.

[4] Diese von den Besten im Berufe hüben und drüben bisher erhoffte und angestrebte Alternative dürfte bei der regen Thätigkeit in medicinischen Kreisen und bei der schnell voranschreitenden Gestaltung der Bacteriologie und deren immer engeren Anlagerung und tieferen Eingreifen in die biologischen und physiologischen Wissensgebiete, für die Mitarbeit des Apothekers unerfüllt bleiben. Das Wesen und alle Beziehungen der Bakteriologie zur Heilkunde und Hygienie liegen so überwiegend auf dem Felde des medicinischen Studiums und Leistens, dass der Apotheker schwerlich noch in nächster Zukunft dafür zur Mitwirkung herbeigezogen werden wird oder kann. Wer dafür Neigung hat und Beruf fühlt, sollte das Studium der einschlägigen medicinischen Hilswissenschaften von vornherein betreten, oder dazu übergehen. Der Weg zu bacteriologischen und hygienischen Berufszweigen wird bald nicht mehr durch die Apotheke gehen. *Fr. H.*

[5] Siehe Rundschau 1893, S. 96.

Nicht mit Unrecht aber mag Dr. Springfeld die Inconsequenz hinsichtlich des Betriebes der Geheimmittel vorhalten.

> "Es waren früher die Apotheker, welche den Geheimmitteln, als einen Eingriff in ihre Domaine, den Krieg erklärten. Als im Jahre 1887 die Ankündigung von Geheimmitteln verboten und deren Verkauf beschränkt wurde, da sind es aber die Apotheker gewesen, welche die Durchführung derartiger Verordnungen erschwerten und schliesslich die Parole erhoben: die Geheimmittel gehören in die Apotheke. Die von der Polizei bedrängten Geheimmittelfabrikanten und Kurpfuscher fanden für ihre Producte ein Asyl in den Apotheken. Je schärfer die Massregeln der Regierung gegen das Geheimmittelunwesen wurden, um so mehr betrachteten die Apotheker den Handel mit Geheimmitteln als ihr Monopol. Dieselben fanden bald aus, dass sich durch Vereinigung von Production und Handel noch bedeutend mehr aus dem Geschäft herausschlagen lässt und wurden zu Erfindern von allerlei Mittelchen. Damit vollzog sich im Apotheker die Metamorphose von Geheimmittelhändler zum Kurpfuscher."
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> "Das Aufhören der Arzneimittelproduction in den Apotheken und die Abhängigkeit des Apothekers von der pharmaceutisch-chemischen Grossindustrie hat dazu geführt, dass die Apotheker jetzt für eine Mehrzahl ihrer Waaren nur eine ungenügende, für die dispensirfertig dosirten und mit Hilfe bacteriologischer Methoden hergestellten Mittel gar keine Garantie übernehmen können und in dieser Beziehung nicht höher stehen als die Drogisten, welche die Mittel aus derselben Quelle beziehen." . . . . "Zur Heranbildung eines Nachwuchses ist die deutsche Apotheke unzureichend und zwischen den hohen wissenschaftlichen Anforderungen des Apothekerexamens und der manuellen Arbeit, welche der examinirte Gehülfe zu vollziehen hat, besteht ein arges Missverhältniss. Dieses hat ein anspruchsvolles und unzufriedenes Personal entstehen lassen."
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> "Dem grösseren Theile der deutschen Apotheken fehlt der Rechtsboden. Die auf ihnen angesammelten Werthe sind unsichere, vor jedem Reformprojecte erzitternde. Damit muss die Sicherheit des Betriebes auf die Dauer leiden."

Diesen und anderen Uebelständen soll nun durch ein im Kultusministerium ausgearbeitetes Gesetz entgegengetreten werden. Die für dessen Berathung herbeigezogene Commission bestand aus 9 Juristen, 4 Medicinern, 9 Apothekerbesitzern und 6 conditionirenden Apothekern.

Die Grundzüge dieses Entwurfes für eine projectirte reichsgesetzliche Regelung des deutschen Apothekerwesens sind mit den Modificationen und deren Begründung seitens der Commission der Brochüre beigedruckt worden. Dieselben haben an sich für die Pharmaceuten des Auslandes geringes Interesse und keinerlei praktischen Werth. Im Interesse und für das Ansehen der deutschen Pharmacie wäre es aber mehr als wünschenswerth, wenn nach so mancherlei verfehlten Anläufen im Laufe vieler Jahrzehnte, dieses fadenscheinige Problem durch eine möglichst schonende, jedenfalls aber peremptorische Erledigung endlich einmal aus der Welt geschafft würde.

Fr. H.

ORIGINAL CONTRIBUTIONS.

Application of the Carvoxime-Method for the Quantitative Estimation of Carvone to Adulterated Spearmint Oil.

By *Edward Kremers* and *Oswald Schreiner*.

(Report of Research Committee G, U. S. P. Revision.)

In an earlier report on a closely related subject[*] the writers demonstrated the applicability of the carvoxime reaction to the quantitative estimation of carvone in pure volatile oils containing this ketone. The results obtained by this method possessed such a decided advantage over those obtained by older methods that it deserved further attention and study. A single physical test can easily be circumvented by adulterers. In fact the number of such tests that are necessary to constitute a stumbling block to the adulterer seem to depend very largely upon the ingenuity of the latter. There can be no doubt that the physical tests which have been employed largely in the examination of volatile oils have done admirable service in making possible a better control of the purity of these complex products. But at the very best they are but imperfect evidence: seldom if ever positive evidence of purity and very frequently very poor negative evidence of absence of impurity. A single positive chemical fact as a rule is worth more than half a dozen physical data. This position will no doubt be better comprehended as the chemical nature of volatile oils and the dependence of this chemical nature upon a host of conditions natural as well as artificial, becomes more and more generally understood.

The chemical examination of volatile oils like the study of their chemical composition is still in its earliest infancy. It is therefore of greatest importance to test carefully every method that at least at its surface appears valuable. Not only should such methods be tested at the hands of different analysts, but under a variety of conditions. A chemical method of this kind should not only give good results under ideal conditions as to purity but even with most adulterated products so as to give positive evidence of the extent

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[* This journal, p. 76.]

of the adulteration. It will become apparent from this report that the carvoxime method for the estimation of carvone in volatile oils will give good positive results even in badly adulterated oils and that the absence of crystallized carvoxime denotes practically an absence of carvone.

As long as we know so little about the chemistry of the carvone-containing oils we must rest satisfied with the quantitative estimation of this constituent. No doubt it will become advisable later, as our knowledge of the subject increases, to supplement this test by others.

Inasmuch as so much stress is being laid on the necessity of chemical tests it should be made clear that the value of physical tests is by no means underestimated by the writers, when properly applied. Physical constants are of the greatest importance in the identification of pure substances that are chemical units, but must from the very nature of the case be of secondary importance only in mixtures of unknown composition. This can clearly be illustrated by calling attention to the fact so well known to analysts that e. g. the specific gravity of a wine is in no way a criterion of the purity of a wine nor even of the alcohol content of a wine.

The attention of the authors has been called to the fact that the oils of cedar-wood and of gurjun balsam are distilled on a large scale and that little appears to be definitely known as to the use to which these oils are put. It is supposed that they are used for the purpose of adulteration and it was pointed out that their applicability to the adulteration of spearmint oil might not have escaped the keen eye of the adulterer.

This gave an excellent opportunity to make a test case of the applicability of the method described in the earlier report already alluded to.

The spearmint oil used was a product purified by redistillation. It had a sp. gr. of 0.933, and when assayed according to the carvoxime method showed a carvone content of about 56.30 p. c. The specimens of cedar-wood oil and gurjun balsam oil were kindly furnished by Messrs. Fritzsche Bros. of New York. Specific gravity and rotatory power of these oils are recorded in the appended table. Both oils consist largely of sesquiterpenes. On account of the high boiling points of these hydrocarbons it was thought that they might prove more troublesome than most other constituents of volatile oils in the quantitative isolation of the carvoxime.

Both oils are also lævogyrate. Cedar-wood oil has a lower rotatory power but higher specific gravity, gurjun balsam oil a higher rotatory power but lower specific gravity than spearmint oil. Either of these oils can be added to the extent of from about 10 to 15 p. c. to spearmint oil without bringing the latter seriously out of the limits of the pharmacopœial requirements. It becomes evident, therefore, that by judiciously mixing the oils of cedar-wood, gurjun balsam and spearmint an adulterated oil may result that will possess approximately the specific gravity and even the rotatory power of genuine spearmint oil and yet be a grossly sophisticated product.

Mixtures of spearmint oil with 25 p. c. of cedar-wood oil and gurjun balsam oil respectively were prepared. The carvone content was estimated according to the carvoxime method formerly described†, and also for the sake of comparison by the fractional distillation method. On account of the presence of the high-boiling sesquiterpenes the carvoxime method had to be slightly modified.

[† loc. cit. p. 78.]

Oil.	Sp. Gr. at 20°.	Rotatory power at 20° in 100 mm. tube.	Carvone as oxime.	Carvone fraction 220° to 230°.	Carvone calculated.	Solubility.
Cedar-wood.	0.949	−23°42′	——	——	——	
Gurjun balsam.	0.915	−123°24′	——	——	——	
Spearmint.	0.933	−47°45′	56.40 p. c. 56.20 "	50.28 p. c.		Soluble in alcohol, glacial acetic acid and carbon disulphide in all proportions.
Spearmint containing 25 p. c. cedar-wood.	0.940	−40°9′	40.80 p. c. 40.49 "	27.20 p. c.	42.22 p. c.	do.
Spearmint containing 25 p. c. gurjun balsam oil.	0.929	−65°4′	39.98 p. c. 40.12 "	29.68 p. c.	42.22 p. c.	do.
U. S. P. Requirements.	0.930 to 0.940					With an equal volume of alcohol it forms a clear solution, which is neutral or slightly acid to litmus paper. When somewhat further diluted with alcohol, it becomes turbid. It also yields a clear solution with an equal volume of glacial acetic acid, and with half its volume of carbon disulphide; but with an equal volume of the latter it forms a turbid mixture.
Mixture of 66⅔ p. c. cedar-wood. 33⅓ " gurjun balsam.	0.938	−55°34′				
Mixture of 50 p. c. spearmint. 33⅓ " cedar-wood. 16⅔ " gurjun balsam.	0.936	−47°30′	29.79 p. c.		28.20 p. c.	

The distillation with water-vapor was continued until the oily portion of the last fractions, collected separately in test-tubes, solidified. These crystals were weighed with the bulk of the carvoxime in the distilling flask.

For the fractional distillation of the adulterated oil 25 g. were used. The fraction distilling within a limit of ten degrees of the boiling point of carvone was collected and weighed. To facilitate comparison the results have been tabulated.

A glance at the table will show that the results obtained by the carvoxime method, while they agree very well among themselves, are somewhat too low. This is due, no doubt, to the presence of the sesquiterpenes which necessitates the longer distillation with water-vapor of the oxime mixture. The sesquiterpenes evidently carry over some of the carvoxime and, keeping it in solution, prevent its crystallization. Whereas the results are not ideal they certainly are fully as satisfactory as might be expected.

Although less was expected from the fractional distillation of the adulterated oils the results fall short by far from the meagre expectations. A comparison of the two methods seems practically out of the question. The influence of the boiling point of the sesquiterpenes upon that of the carvone is by far too great to base any conclusions upon the results thus obtained.

The carvoxime method with smaller amounts of material gives much better results than the fractional distillation method with comparatively large quantities of oil. It is therefore more economic as well as more reliable. Furthermore the oily distillate obtained by the distillation with water-vapor, especially when collected in fractions, can serve conveniently for the examination of the adulterant. In this particular case Wallach's sesquiterpene reaction might be applied to advantage.

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Medicinal Plants of Brazil.*

By *Dr. Theodor Peckolt of Rio de Janeiro.*

Popular Remedies from the Lauraceæ.—Continued.

In der Rinde wurde gefunden: Wasser, 25.128; wachsartige Substanz, 0.195; festes Fett, 0.750; Weichharz, 0.405; Harzsäure, 2.850; Perseit, 0.900; Extract etc., 4.810; Asche, 7.0 Procent. Das Fett hat die Consistenz von Schweineschmalz, ist bräunlich-grün, von angenehm aromatischem Geruch und Geschmack. Auf Platinblech verbrennt es mit sehr lebhafter Flamme von aromatischem Geruch und ohne Rückstand. Mit Schwefelsäure färbt es sich rothbraun, dann eine zähe klebrige, schwarze Masse bildend. Es ist löslich in Petroläther, Benzol, Chloroform, Aether und siedendem absolutem Alcohol. Das Weichharz hat Terpentinconsistenz, ist dunkelgrün, von schwach aromatischem Geruch und beissend aromatischem Nachgeschmack. Es verbrennt ohne Rückstand. Mit Schwefelsäure zertheilt es sich in schwarzen Streifen und die Säure färbt sich hellbraun. Es ist löslich in Aether, Chloroform, Amylalcohol und absolutem Alcohol. Ferner ist in der Rinde eine dem Glycerrhyzin ähnliche Substanz vorhanden, doch ist weitere Untersuchung nöthig, um ein Urtheil darüber abzugeben. Ebenso bin ich überzeugt, dass die frische Rinde ätherisches Oel liefert, doch ist es ungemein schwierig, dieselbe in grossen Portionen zu erhalten, da Niemand den Baum opfern will. Ich konnte deshalb nur aus meinem Garten Material erhalten.

Zehn Kilo frischer Blätter wurden destillirt und nur 0.5 Gram eines stearoptenartigen Oeles, von Lorbeer und Campher ähnlichem Geruch und brennend aromatischem Geschmack erhalten. In den frischen Blättern wurde gefunden: Wasser, 64.0; ätherisches Oel, 0.005; wachsartige Substanz, 1.333; Weichharz, 1.334; Harz, 0.994; Harzsäure, 0.335; Bitterstoff, 0.277; Perseit, 1.700; zuckerhaltiger Extractivstoff, 4.866; Chlorophyll, Extract etc., 2.621; Asche, 3.0. Das Weichharz

In the bark the following was found: water, 25.125; wax-like body, 0.195; firm fat, 0.750; soft resin, 0.405; resin acid, 2.850; perseite, 0.900; extractive, etc., 4.810; ash, 7.0 percent. The fat has the consistence of lard, is brownish-green, of agreeable, aromatic odor and taste. On platinum foil, it burns with a very bright flame, with aromatic odor and leaves no residue. With sulphuric acid, it takes on a reddish-brown color, forming a tough, sticky, black mass. It is soluble in petroleum ether, benzol, chloroform, ether and boiling absolute alcohol. The soft resin has the consistence of turpentine, is dark green, of a faintly aromatic odor and has a biting, aromatic aftertaste. With sulphuric acid, it separates into dark streaks and the acid becomes light brown. It is soluble in ether, chloroform, amyl alcohol and absolute alcohol. In addition, the bark contains a substance similar to glycerrhizin, but a further investigation is necessary before judgment can be given. I am likewise convinced that the fresh bark contains ethereal oil although it is extremely difficult to obtain it in large quantities, no one being willing to sacrifice the tree. Consequently, I could obtain material only from my own garden.

Ten kilos of fresh leaves were distilled and only 0.5 grm. of a stearopten-like oil with an odor resembling laurel and camphor and with a burning, aromatic taste, was obtained. In the fresh leaves was found: water, 64.0; ethereal oil, 0.005; wax-like body, 1.333; soft resin, 1.334; resin, 0.994; resin acid, 0.355; bitter principle, 0.277; perseite, 1.700; sugar containing extractive materials, 4.866; chlorophyll, extractive, etc., 2.621; ash, 3.0 percent. The soft resin is dark brown,

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* Continued from p. 227. Translated for the Review by Dr. R. H. True, Asst. Prof. of Pharmacognosy at the University of Wisconsin.

ist dunkelbraun, von Terpenthinconsistenz, schwach lorbeerartigem Geruch und schwach beissendem Nachgeschmack. Es ist löslich in Petroläther, Benzol, Chloroform, Aether und absolutem Alcohol. Es verbrennt mit aromatischem Geruch ohne Rückstand. Das dunkelgrüne, stark klebende Harz ist geruchlos, von ekelerregendem Nachgeschmack. Es verbrennt ohne Rückstand und ist nur in Aether, Chloroform, Eisessig und Alcohol löslich. Die geruch- und geschmacklose, röthlich braune Harzsäure ist fest, zerbrechlich, und verbrennt mit lebhafter Flamme, Asche hinterlassend. Es löst sich nur in Eisessig, Amylalcohol, Alcohol und Ammoniak. Aus den Blättern ist der Perseit am vortheilhaftesten zu erhalten, in dem die getrockneten, pulverisirten Blätter mit Petroläther, dann mit Aether und schliesslich mit kaltem Alcohol (0.800) extrahirt werden. Der Blätterrückstand wird dann mit destillirtem Wasser vollständig ausgezogen, das Extract bis zum Krystallhäutchen abgedampft und der Kälte ausgesetzt. Nachdem das Perseit von der Mutterlauge getrennt worden, ist nur eine einmalige Krystallisation aus siedendem Alcohol hinreichend reine Krystalle zu erhalten.

Die Samenkerne sind am reichhaltigsten an Perseit, doch ist es ungemein schwierig dasselbe aus denselben gewonnen zu reinigen. Früher wurde der Süssstoff für Mannit erklärt. A. Münz und V. Marvano fanden denselben nicht übereinstimmend und nannten denselben Perseit. Dieselben fanden im Fruchtfleische 1.3 bis 6.8 Procent und in den Blättern 2 Procent Perseit. Den Perseit aus den trockenen Substanzen berechnet, fand ich: Rinde, 1.202; Fruchtfleisch, 4.050; Blätter, 4.722; Kern, 8.858 Procent.

Das Fruchtfleisch mit etwas Citronensaft und Zucker zu einem Brei angerührt, zuweilen auch mit Weisswein, ist nicht allein eine nahrhafte, sondern auch eine wohlschmeckende Speise. Einige Personen geniessen dasselbe auch mit Salz und Pfeffer, doch nie als Suppe und Gemüse wie in Mexico und Mittel-Amerika.

Die Fruchtschale wird vom Volke als Wurmmittel benutzt und zwar mit gleichen Theilen Zucker zur Masse angestossen, theelöffelweise gegeben, dann Ricinusöl. Das Pulver der Samenkerne gilt beim Volke als Aphrodisiacum, dreimal täglich 4 Grammen mit Weisswein genommen. Officinell ist das Fluidextract. Bei Wechselfiebern, während der Apyrexie, giebt man zweistündlich einen Theelöffel voll. Nach Fröhling in Baltimore wird dasselbe äusserlich oder hypodermatisch als schmerzstillendes Mittel bei intercostaler Neuralgie als wirksam gehalten. Hier wird zu demselben Zwecke die Tinctur der frischen Kerne (1:2) benutzt: innerlich 8 Tropfen zweistündlich und Einreibung.

Wird der frische Kern beschädigt, so quellen aus der Wundfläche helle röthliche Tropfen, welche sich sogleich dunkelroth färben und zum Zeichnen der Wäsche benutzt werden. Das Decoct des getrockneten Kernes dient als Getränk bei Blasenkatarrh. Bei Dysenterie wird eine Emulsion von einem Kern, mit einer halben Flasche Wasser bereitet, innerlich verabreicht und zwar zweistündlich ein Esslöffel voll. Halbinnerlich, Morgens und Abends ein Klystier, eine Emulsion von einem Kerne mit soviel Wasser als zu 8 Klystieren erforderlich ist. Ein gerühmtes Aphrodysiacum sind auch die Blumenknospen, welche mit gleichen

with consistence of turpentine, faint laurel-like odor and weak, biting aftertaste. It is soluble in petroleum ether, benzol, chloroform, ether and absolute alcohol. It burns with aromatic odor, without residue. The dark green, sticky resin is odorless, with a nauseating aftertaste. It burns without residue and is soluble only in ether, chloroform, glacial acetic acid and alcohol. The odorless, tasteless, reddish-brown resin acid is solid, brittle and burns with bright flame, leaving an ash. It dissolves only in glacial acetic acid, amyl alcohol, alcohol and ammonia. Perseite is most advantageously obtained from the leaves by drying, powdering, extracting with petroleum ether, then with ether, and lastly with cold alcohol (0.800). The residue of the leaves is then extracted completely with distilled water, the extract evaporated until a film of crystals forms, when it is set in the cold. After the separation of the perseite from the mother liquid a single crystallization from boiling alcohol suffices to give pure crystals.

The kernels of the seeds are richest in perseite, yet it is unusually difficult to purify it when obtained from this source. Formerly this sweet substance was declared to be mannite. A. Muenz and V. Marvano found it to be different from mannite and called it perseite. These authors found in the flesh of the fruit 1.3 to 6.8 percent and in the leaves 2 percent perseite. I found perseite calculated on the dry weight as follows; bark, 1.202 percent; flesh of fruit, 4.050 percent; leaves, 4.722 percent; kernel of seed, 8.858 percent.

The flesh of the fruit, with lemon juice and sugar added, stirred to a broth-like consistency, with the addition sometimes of white wine also, makes not only a nutritious but also a palatable aliment. Some people eat it also with pepper and salt but never as soup or vegetable as in Mexico or Central America.

The peel of the fruit is used by the people as an anthelminthic when ground with equal parts of sugar. It is administered by the teaspoonful followed by castor oil. The powdered kernel of the seed is popularly regarded as an aphrodisiac taken three times daily in 4 grams of white wine. The fluid extract is official. In intermittent fever during apyrexia, a teaspoonful is given every two hours. According to Froehling in Baltimore, it is regarded as effective either externally or hypodermically in relieving pain in intercostal neuralgia. Here the tincture of the fresh kernel (1:2) is used for the same purpose, eight drops internally every two hours, also rubbed in externally.

When a fresh seed is injured, clear, reddish drops ooze from the wounded surface. These take on immediately a dark red color and are used for marking laundry articles. The decoction of the dry seeds serves as a drink in catarrh of the bladder. In dysentery an emulsion of one seed to half a glass of water is administered internally, a tablespoonful every two hours. Semi-internally mornings and evenings as injection, an emulsion of one seed is used with water requisite for eight injections. The flower buds macerated with equal parts of sugar brandy are a prized aphrodisiac. A liquor glassful of the extract is taken with wine. In a

Theilen Zuckerbranntwein macerirt werden. Ein Licörgläschen des Extractes wird mit Wein genommen. In der Dosis von 12 bis 16 Tropfen viermal täglich dient es auch als Emmenagogum. Zu gleichem Zwecke dient auch der Thee der getrockneten Sprossen und Blätter. Diese werden auch als Getränk bei Leberkrankheiten und Milzaffectionen benutzt; ebenfalls äusserlich als Waschung unreiner Wunden. Das Decoct der Rinde wird bei Diarrhoe genommen.

Persea microneura Meissn. Im Staate Rio de Janeiro als *Abacateiro cheiroso* — wohlriechender Abacate (zufolge der wohlriechenden Blüthen) bekannt; doch wird derselbe auch vielfach *Lauro amorello* wie *Persea splendens* benannt.

Dieser 6 bis 9 Meter hohe Baum wird nicht arzneilich benutzt, doch ist das gelbe, schwach Sassafras ähnlich riechende Holz sehr geschätzt zu Möbeln und Bauten, die der Holzvernichter Termite auch unbeschädigt lässt.

Cryptocaria moschata Mart. Diese Pflanze kommt vor in den gebirgigen Urwäldern der Staaten S. Paulo, Minas, Bahia, Espirito Santo und Rio de Janeiro, und ist unter dem Volksnamen *Nos moscada do Brasil* — brasilianische Muskatnuss bekannt. Dieselbe ist ein 10 bis 15 Meter hoher Baum, von Aussehen des Lorbeerbaumes, mit lederartigen, länglich-lancettlichen, zugespitzten Blättern. Der Blüthenstand besteht aus achselständigen, wenigblüthigen Rispen mit sehr kleinen weissgelblichen, wohlriechenden Blüthen. Die Beere, vollständig von der Achse umschlossen, ist einsamig, oben abgerundet und unten zugespitzt. Der Same ist oval und reift im September.

Die frischen reifen Früchte sind etwas kleiner als eine Muskatnuss. Die fleischige, blassgelbliche Cupula welche die Frucht umgiebt, ist 6 mm. dick, von schwach aromatischem Geruch und süsslichem, der Jambofrucht ähnlichem Geschmack. Beim trocknen der Beere fällt diese Hülle ab und es bleibt eine kapselähnliche Frucht, welche den Kern bis zur Keimung umschliesst. Diese Hülle ist hellbraun, der Länge nach regelmässig gerieft, holzig, leicht zerbrechbar. Zwischen dieser holzartigen Hülle und dem Samenkern befindet sich eine kaum ½ mm. dicke Lage eines dickflüssigen, harzigen Balsams, von täuschend ähnlichem Cajeput Geruch und brennend aromatischem Geschmack. Der Same ist mit einer feinen lederartigen Hülle umgeben, hat die Grösse eines kleinen Haselnusskernes, ist im Durchschnitt gelblich, von aromatischem Geruch und pfefferartig beissendem, sehr gewürzhaftem Geschmack.

Eine frische Beere wog im Mittel 12.812 g. Davon beträgt die Cupula (Fleischhülle) 73 p. c., das harzige Epicarp 13 p. c., Balsam und Same 14 p. c. Die reifen frischen Früchte ohne Cupula riechen stark aromatisch, doch ist der Geruch schwer zu beschreiben, fast ähnlich einer Mischung von Lorbeer, Sassafras, Cajeput und Maskatnuss; doch hat derselbe keine Aehnlichkeit mit Pichurim wie einige Autoren bemerken, eher Lorbeer ähnlich.

Die frische, fleischige Cupula, bei 100° getrocknet, verliert an Feuchtigkeit 86.581 p. c.; die holzige, lederartige Schale 48.544 p. c.; der Samenkern 43.936 p. c.

Zehn Kilogram der von der Cupula befreiten, gestossenen Früchte, mit Wasser destillirt, lieferten 37.222 g. aetherisches Oel. Dasselbe ist dünnflüssig, von gelbbräunlicher Farbe, von durchdringendem, aromatischem Geruch und brennend

dose of from twelve to sixteen drops four times daily it acts also as an emmenagogue. A tea prepared from the dried shoots and leaves serves also the same purpose. This is used also as a beverage in liver and spleen affections, likewise externally as a wash for unclean wounds. The decoction of the bark is taken for diarrhoea.

Persea microneura Meissn. In the state Rio de Janeiro known as *Abacateiro cheiroso* — fragrant Abacate (because of its fragrant flowers); it is also often called *Lauro amarello* in common with *Persea splendens.*

This tree, six to nine meters high, is not used medicinally, but the yellow wood with its sassafras-like odor is highly valued for furniture and structures since it is uninjured by the wood-destroying termites.

Cryptocaria moschato Mart. This plant occurs in the primeval mountainous forests of the states S. Paulo, Minas, Bahia, Espirito Santo and Rio de Janeiro, and is popularly known as *Nos moscada do Brazil* — Brazilian nutmeg. It is a tree reaching a height of 10 to 15 meters, resembling the laurel tree, with leathery, oblong-lanceolate, acuminate leaves. The inflorescence consists of axillary, few-flowered panicles with very small, yellowish-white, fragrant flowers. The berry completely enclosed by the axis is one-celled, rounded above and pointed below. The seed is oval and ripens in September.

The fresh, ripe fruits are somewhat smaller than nutmegs. The fleshy, pale-yellow cupule which encloses the fruit is 6 mm. thick, of weakly aromatic odor and has a sweetish taste which resembles the jambo fruit. On drying the berries, this envelope falls off and a capsule-like fruit remains which encloses the seed until germination. This covering is light-brown, regularly marked lengthwise by a "bloom," woody, easily broken. Between this woody envelope and the seed is found a layer, hardly one-half mm. thick of a viscid, resinous balsam with an odor deceivingly like cajeput, burning with an aromatic odor. The seed is enclosed by a delicate, leathery covering, has the size of a small hazel nut, is yellowish in cross section, of aromatic odor with a very spicy, biting, peppery taste.

A fresh berry on the average weighed 12.812 grm. Of this total, the cupule, the fleshly envelope, contributed 73 percent; the resin-containing epicarp, 13 percent; balsam and seed, 14 percent. The fresh ripe fruits without cupule, smell strongly aromatic, having an odor hard to describe, almost like a mixture of laurel, sassafras, cajeput and nutmeg; it has, however, no similarity with pichurim as some authors notice, resembling rather the laurel.

The fresh, fleshy cupule, dried at 100° loses 86.581 percent; the woody, leathery envelope, 48.544 percent; the seed, 43.936 percent.

Ten kilograms of the crushed fruits, freed from the cupule, when distilled with water, gave 37.222 grm. of ethereal oil. This is fluid, of brownish-yellow color, of penetrating, aromatic odor, and burning, spicy taste. Sp. gr. 0.917 at

gewürzhaftem Geschmack. Sp. Gew. 0.917 bei 15.0° C. Sandelroth löst sich in dem Oel mit orangerother Farbe; Jod ohne bemerkbare Reaction. Mit Natrium verdickt sich das Oel gallertartig ohne scheinbar das Metal anzugreifen. Mit Salzsäure geschüttelt zeigt sich keine Reaction. Nach Anwendung geringer Wärme entsteht eine stürmische Reaction, während das Oel eine balsamartige Consistenz und dunkelbraune Farbe annimmt. Mit rauchender Salpetersäure versetzt tritt sofort eine heftige Reaction ein; das Oel verharzt mit gelber Farbe. Gut ausgewaschen besitzt das zähe, hellgelbe Harz einen origanumähnlichen Geruch. Schwefelsäure färbt das Oel purpurroth und es bleibt schliesslich eine weiche, schwarzbraune, harzartige Masse. Schwefelsäure Lösung von Kaliumbichromat färbt das Oel dunkelbraun und entwickelt einen schwachen Bittermandelöl Geruch. Erwärmt man die Mischung so färbt sich dieselbe hellbraun unter Entwickelung eines penetranten, zu Thränen reizenden, aromatischen Geruches. In Alcohol vom Sp. Gew. 0.830 ist das Oel in allen Verhältnissen löslich.

Ferner wurden in den Früchten gefunden:

4 p. c. eines dickflüssigen, braungrünlichen, fetten Oeles, von angenehmem, etwas lorbeerähnlichem Geruche, und unangenehm kratzend, aromatischem, terpentinartigem Geschmack. Sp. Gew. 0.998 bei 20° C. Es erstarrt bei 16° C. zu einer talgartigen Masse. Dasselbe is löslich in Petrolaether, Benzol, Chloroform und Aether, erfordert aber 60 Theile kalten und 28 Theile siedenden absoluten Alcohols zur Lösung, Mit Schwefelsäure färbt es sich rothbraun; mit Kalilauge verseift es mit dunkel orangerother Farbe.

2.575 p. c. eines rothbraunen Weichharzes von Terpentin Consistenz, aromatischem Geruch und beissend bitterem Nachgeschmack. Auf Platinblech erhitzt verbrennt es mit lebhafter Flamme ohne Rückstand. Der Rauch hat einen angenehmen aromatischen, olibanumähnlichen Geruch. Dasselbe ist unlöslich in Petrolaether, Weingeist und Ammoniak; leicht löslich in Benzol, Chloroform, Aether und absolutem Alcohol. Dieses Weichharz bildet die balsamartige Harzmasse, welche die Samen einhüllt.

8.625 p. c. einer dunkelbraunen, festen Harzsäure, von schwach aromatischem Geruch, geschmacklos. Es verbrennt mit lebhafter Flamme und schwachem, etwas sassafrasähnlichem Geruch, Spuren von Asche hinterlassend. Es löst sich nur in Eisessig, Alcohol und Ammoniak.

Das spirituöse Extract der von der Cupula befreiten Beeren mit angesäuertem Wasser behandelt, die Lösung mit Natrium Carbonat versetzt, dann mit Aether ausgeschüttelt liefert nach dem Verdunsten des Aethers feine, farblose Krystallnadeln. Es wurden nur 0.007 p. c. erhalten. Dieselben sind geruchlos, von eigenthümlich bitterem Geschmack. Auf Platinblech erhitzt schmelzen dieselben und verflüchtigen sich vollständig. Dieselben sind löslich in Aether und Alcohol, unlöslich in kaltem Wasser. Beim Sieden löst sich nur wenig und scheidet sich beim Erkalten wieder aus. Sie lösen sich leicht in angesäuertem Wasser. Aus dem wässerigen Decocte der Frucht konnte ich das Product nicht erhalten. Wahrscheinlich ist es das von Dr. Bancroft im Jahre 1887 dargestellte Cryptarin.

Die Infusion der Beeren wird als Medicament bei Dysenterie benutzt, ebenfalls allgemein als

15° C. Sandalred is dissolved in the oil with an orange-red color; iodine produces no noticeable reaction. With sodium, the oil thickens to a jelly-like mass without apparently affecting the metal. When shaken with hydrochloric acid, no reaction is noticeable. On slightly warming an energetic reaction sets in, the oil taking on a balsam-like consistence and a dark brown color. With fuming nitric acid a violent reaction takes place, the oil becomes resinous, with yellow color. When well washed out, the sticky, yellow resin has an origanum-like odor. Sulphuric acid colors the oil reddish-purple and a soft blackish-brown resinous mass remains. Sulphuric acid solution of potassium bichromate gives the oil a dark brown color and developes a faint odor of bitter almonds. When the mixture is warmed, it takes on a dark brown color at the same time developing an aromatic, penetrating odor which by its irritation brings tears to the eyes. In alcohol of sp. gr. 0.830, the oil is soluble in all proportions.

There was further found in the fruits the following:

4 percent of a thickly fluid, brownish-green, fatty oil of agreeable, somewhat laurel-like odor and rough, unpleasant, aromatic turpentine-like taste. Sp. gr. 0.998 at 20° C. It solidifies at 16° C. to a tallow-like mass. It is soluble in petroleum ether, benzol, chloroform and ether; to bring it into solution 60 parts of cold and 28 parts of boiling absolute alcohol are needed. With sulphuric acid it becomes reddish-brown; with potassium hydroxide it saponifies with dark, orange-red color.

2.575 percent of a reddish-brown, soft resin having the consistence of turpentine, an aromatic odor and a biting, bitter aftertaste. Heated on platinum foil, it burns with a bright flame without residue. The smoke has an agreeable, aromatic, olibanum-like odor. It is insoluble in petroleum ether, spirits of wine and ammonia; it dissolves readily in benzol, chloroform, ether and absolute alcohol. This soft resin forms the balsam-like, resinous mass that surrounds the seed.

8.625 percent of a dark brown, solid resin acid of weakly aromatic odor, tasteless. It burns with a bright flame and faint, somewhat sassafras-like odor, leaving traces of an ash. It dissolves only in glacial acetic acid, alcohol and ammonia.

When the alcoholic extract of the berries freed from the cupule is treated with acidulated water, to this solution sodium carbonate added and then shaken out with ether, fine, colorless needle-shaped cyrstals remain after the evaporation of the ether. Only 0.007 percent were obtained. They are odorless, of peculiar, bitter taste. When heated on platinum foil, they melt and volatilize completely. These crystals are soluble in ether and alcohol; are insoluble in cold water. On boiling, but little dissolves and this crystallizes out again upon cooling. They dissolve easily in acidulated water. From an aqueous decoction of the fruit, I could not obtain this product. Probably it is the cryptarin obtained by Dr. Bancroft in 1887.

The infusion of the berries is used as medicine in dysentery, likewise generally as a carminative.

Carminativ. Auch ist es ein sehr beliebtes Volksheilmittel bei chronischem Rheumatismus. Zu diesem Zwecke werden sechs Beeren gestossen und mit einer halben Flasche Zuckerbranntwein macerirt. Von dieser Infusion wird dreimal täglich ein Esslöffelvoll mit Zucker und Wasser genommen. Die Aerzte geben die Tinctur (1:6) dreimal täglich und zwar 5 g. mit Zucker und Wasser. Dieselbe wird zugleich zum Einreiben benutzt. Mit fettem Oel angestossen dienen die Beeren als Magenpflaster. Ein Liniment wird bereitet indem ein Theil Früchte mit sieben Theilen Oel digerirt und dann ausgepresst wird. Dasselbe dient zur Einreibung bei Kolik der Kinder, sowie als Zusatz zu Suppositorien bei Hämorrhoiden. Die mild aromatische Rinde dient als Tonicum sowie bei Blähungen. Dieselbe wird aber wenig als Medicament benutzt, häufiger als Gewürz zu Speisen, d[illegible] dieselbe einen Geschmack besitzt welcher einer Mischung von Pfeffer und Nelken ähnlich ist. Die Früchte jedoch werden nie zur Würze benutzt.

Das schwere, weissbräunliche Holz ist sehr dauerhaft und sehr gesucht zur Anfertigung von Möbeln. Dieser nützliche, immergrüne Baum sollte cultivirt werden.

Die gleichfalls aromatischen Früchte der *Cryptocaria guyanensis* Meissn., werden auf gleiche Weise benutzt. Dieser Baum wächst in den Aequatorial Staaten Pará und Amazonas und ist unter der Tupibenennung — *Cao-xio* bekannt. Die Rinde soll geruchlos sein. Das gelbliche Holz dient zu Möbeln.

It is also a favorite popular remedy for chronic rheumatism. For this purpose, six berries are crushed and macerated in a half-bottle of sugar brandy. A tablespoonful of this with water and sugar is taken three times daily. Physicians give the tincture (1:6) three times daily, 5 grm. with sugar and water. It is also applied externally. Crushed and mixed with fatty oil, the berries serve as a stomach plaster. A liniment is prepared by digesting one part of the fruits with seven parts of oil and expressing. It is applied externally for colic on children and is also added to suppositories in hemorrhoids. The mildly aromatic bark serves as a tonic and is also used for flatulence. It is, however, little used as a medicine, more commonly as a spice for foods since it has a taste resembling a mixture of pepper and cloves. The fruits, however, are never used as spice.

This heavy, whitish-brown wood is very durable and is much used for making furniture. This useful evergreen tree should be cultivated.

The likewise aromatic fruits of *Cryptocaria guyanensis* Meissn., are used in the same manner as the above. This tree grows in the equatorial states Pará and Amazonas and is known by the Tupi name, *Cao-xio*. The bark is said to be odorless. The yellow wood is used for furniture.

(To be continued.)

Solution of Subacetate of Lead.

By *Carl E. Smith.*

It was noticed, while adjusting a quantity of this preparation to the U. S. P. standard, that there is a lack of agreement between the accepted specific gravity and the strength as determined by the volumetric method given. An investigation was made to determine the reason for this discrepancy, and the results, together with those of other experiments, made in connection with the subject, may be summarized as follows:

1. The specific gravity of a solution containing 25 p. c. of subacetate was found to be higher than that given in the Pharmacopœia, being 1.2485 at 15° instead of 1.195 (U. S. P. 1890) or 1.228 (U. S. P. 1880).

2. The official assay method gave unsatisfactory and misleading results. By a modification the accuracy was increased somewhat, but could not be made to approach that of the gravimetric methods.

3. The quantities of lead acetate and litharge, directed by the U. S. P. of 1890, were found insufficient to make a preparation of the full strength required, when materials of high grade were used and much care taken in the manipulations.

4. It was shown that the solution can be made in nearly as short a time without heat, as it can by boiling, and of as high a strength from the same quantities of materials.

Preparation.—In the formula of the U. S. P. the acetate and oxide are theoretically in molecular proportion to form the compound $Pb(C_2H_3O_2)_2.PbO$, but the solution will necessarily be somewhat less basic than this. The product is brought to a definite weight before filtration and is intended to contain 25 p. c. of this salt, as determined by the amount of lead found, and irrespective of the amount of acetic acid present. Now, if it be assumed that both acetate and oxide are chemically pure and all carbonic acid could be excluded, the highest obtainable strength would be 24.58 p. c., as a calculation will readily show. It would naturally be expected that in practice the strength would fall short of these theoretical figures, but as a matter of fact they are approached quite closely, and may even be exceeded under certain conditions.

By using pure acetate, only slightly deficient in water of crystallization, and litharge, which lost 0.45 p. c. on ignition (water and carbonic acid), with recently distilled water, all in U. S. P. proportions, a number of small experimental lots were obtained, varying in strength between 24.2 and 24.5 p. c., some made by boiling, others by shaking in a bottle without heat.

The insoluble matter in them, consisting mostly of lead carbonate, some insoluble basic acetate and small particles of metallic lead, represented on an average 0.5 p. c. of the product, although one would suppose it to be much more, because of its bulky appearance.

Preparations of the full strength have been reported, claimed to have been made by the U. S. P. process. That this strength has been reached may be explained by the fact that acetate of lead, as found in the market, is often deficient in water of crystallization and occasionally a little basic, which would cause a proportionate increase in the amount of lead in solution.

It is plain, however, that under normal conditions the U. S. P. standard cannot be quite reached. It would therefore seem advisable to increase the acetate and oxide, each by at least 5 gm. for every 1000 gm. of product, if it is expected to be fully up to the required standard, when freshly made.

Digestion on a water-bath, instead of boiling, cannot be recommended, as it requires much longer, usually 5 to 6 hours, unless the mixture is stirred very frequently and much more carbonic acid is absorbed. Solutions made in this way from U. S. P. quantities averaged about 22 p. c.

It may be mentioned in this connection that some pharmacists seem to have an erroneous idea as to what constitutes boiling. An instance came under the writer's notice where a pharmacist considered that he was boiling a solution, when the vessel containing it was immersed in a bath of boiling water.

Cold Process.—To obtain the best results by the cold process, it appears to be necessary to keep the mixture agitated almost constantly until finished or nearly finished. But when this is done, the time required is remarkably short. When kept gently in motion just sufficient to prevent the litharge from aggregating into hard lumps, the product may be completed in 1 to 1½ hour. When this rule as to shaking is not observed, the litharge will "cake" and become covered with a coating of carbonate, which prevents further solvent action of the acetate. The solution is judged to be finished when no more reddish or yellowish particles of litharge are visible and the sediment is of a grayish-white color with perhaps some black particles of metallic lead. There was found to be no particular advantage in a very violent agitation. Solutions made in the way described were finished in nearly as short a time as others were by constant and very powerful agitation in a mechanical shaking apparatus.

Assay.—The official method of titrating with sulphuric acid, using methyl orange as indicator, is far from satisfactory. The color of the indicator will change long before the precipitation is ended, owing to the liberated acetic acid and, moreover, all lead cannot be precipitated from an aqueous solution without an excess of sulphuric acid.

A solution, which contained 24.4 p. c. of subacetate, gave 21 p. c. by this method when the endreaction was placed at a point where the change of color became distinctly visible.

Titration with sulphuric acid, without an indicator, to the end of precipitation, gave 23.5 p. c.

Titration of an alcoholic solution with sulphuric acid, adjusted to contain about 50 p. c. of alcohol at end of titration, gave 24 p. c. This mode of operation and the preceding one are rather tedious.

Titration with decinormal oxalic acid and potassium permanganate gave 23.8 to 23.9 p. c.

This proved to be the most satisfactory of the volumetric methods tried. The results were uniformly 0.5 to 0.6 p. c. lower than the gravimetric estimation as sulphate, even when the details were varied considerably. One drawback to its general use is the possible presence of empyreumatic matter in the solution, derived from the acetate. This would vitiate the result, as a certain amount of permanganate would be reduced by it.

The best results by the method were obtained when proceeding in this way:

Weigh about 4 gm. in a 200 cc. graduated flask. Add 80 cc. of $\frac{N}{10}$ oxalic acid, fill to the mark with water and mix well. Let stand until clear, then separate 100 cc. by means of a pipette or by filtration and add to it 10 cc. of diluted sulphuric acid. Heat the solution and titrate the excess of oxalic acid with $\frac{N}{10}$ potassium permanganate. About 4 cc. will be required. 1 cc. of $\frac{N}{10}$ oxalic acid = 0.013662 gm. of subacetate of lead, $Pb(C_2H_3O_2)_2.PbO$.

The gravimetric methods are, of course, to be preferred whenever an accurate adjustment is desired. All estimations of lead mentioned in this paper were made, except when otherwise stated, by precipitating it as sulphate from an alcoholic solution and weighing it.

All these methods do nothing more than determine more or less accurately the amount of lead the solution contains and the Pharmacopœia gives no test to show the extent of its basicity. The official test of precipitation with a solution of gum Arabic proves presence or absence of basic salt, but a solution would not have to contain much of the latter in order to stand the test. A method for estimating, at least approximately, the alkalinity of the solution would therefore be desirable as an addition to the other official tests.

Titration with sulphuric acid, with litmus solution as indicator, is rather unsatisfactory for this purpose, as the litmus is gradually precipitated during addition of the acid. Litmus paper is better, but the change of color is not prompt enough. When enough sulphuric acid was added to change the color of the paper very slightly beyond the neutral point, a ratio of $5Pb(C_2H_3O_2)_2$ to 6PbO was indicated in a solution, which was known to contain equal molecules of acetate and oxide with a very slight excess of the former.

Substitution of nitric for sulphuric acid, using litmus solution, would probably give better results, as the lead remains in solution and the endreaction can be seen more distinctly, but the writer has not given this a thorough trial.

Specific Gravity.—The U. S. P. of 1890 gives the sp. gr. of the official solution as 1.195 at 15° and the U. S. P. of 1880 gives 1.228 for a preparation of the same strength. Both are considerably too low.

The sp. gr. of a solution, made by the directions of the U. S. P. of 1890, and containing 24.5 p. c. of subacetate, was 1.2365 at 15°.

The sp. gr. of a solution, standardized accurately to 25 p. c. of subacetate and made by the cold process, was 1.2485 at 15°.

These determinations were made with a sp. gr. bottle of 100 gm. capacity, such as is described by Dr. E. R. Squibb in the Ephemeris, vol. III, p. 1162.

It is judged that a preparation having the sp. gr. of the U. S. P. of 1890, could not be much stronger than 20 p. c.

Brooklyn, N. Y., October 1896.

Professor George F. H. Markoe.

By *Wilbur L. Scoville.*[*]

Professor George F. H. Markoe was found dead upon the floor of his room in the laboratory of Joseph Burnett & Co., Boston, where he was employed as chief chemist, on the morning of Friday, Sept. 25. He had been in poor health for some time, but pluckily continued at his work, and few suspected his real condition. He was last seen alive on the afternoon of Sept. 24, when he was about his duties at the laboratory, and seemed in his usual health. But he did not appear at his home that night, and a search was instituted for him, which was unsuccessful until the opening of the Burnett laboratories on Friday morning, when his lifeless body was found upon the floor, where it had evidently lain for some hours. The immediate cause of death was apoplexy, and the end was probably painless.

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[*] From data collected by Mr. Jordan.

The funeral was held from the South Congregational Church, Boston, on Monday afternoon, Sept. 29, Dr. Edward Everett Hale officiating, and was largely attended. The interment was at Mt. Auburn Cemetery.

George Frederic Holmes Markoe was born in Valparaiso, Chili, S. A., on Jan. 10, 1840. His early childhood was spent in that country until in 1850, when he came to Salem, Mass., where his education was obtained in the public schools. He began his pharmaceutical career in the store of Mr. James Emerton of Salem, where he immediately began his association with the leading minds of pharmacy through their writings, and a persistent and well-directed course of study on his part.

In 1861 he came to Boston and entered the employ of Mr. Charles T. Carney.

About 1863 he entered the store of Joseph T. Brown, and continued with this firm until 1873, when he became proprietor of the then branch store of the firm on Warren and Dudley streets, in the Roxbury district.

His career in this store was characterized by activity along chemical lines. He was a pioneer in manufacturing pharmacy, and did a considerable business as a maker of chemicals and chemical solutions. Here his process for the manufacture of phosphoric acid by the action of bromine and nitric acid on phosphorus was evolved. His fondness for experiment is shown in the fact that he was the first in this country to manufacture chloral. He also did much analytical work, and was much sought for as counsel in practical methods or improvements in chemical processes.

In 1890 he retired from retail pharmacy and has since devoted himself to his work at the Burnett laboratory, to teaching, and to analytical work.

The early difficulties of his career in the line of study led him to sympathize with the apprentices of few opportunities, and he quickly made his influence felt on their behalf. In 1864 he became a member of the Massachusetts College of Pharmacy, which then existed as an organization, but not as a teaching institution. He immediately urged the establishment of a course of instruction, and succeeded in starting the present institution by a series of free lectures on pharmacy and chemistry, which he delivered to a class of 20 in the spring of 1867. This course was so successful that the college resolved to establish a permanent school of pharmacy, and Mr. Markoe was appointed lecturer on practical pharmacy, and a year later, having himself received the degree of Ph. G., was made permanent professor of pharmacy. His zeal and vigor during these early days of the college has earned him the familiar title of "Father of the Massachusetts College of Pharmacy," a title which fitted him well.

In 1879 Professor Markoe was transferred to the chair of pharmaceutical chemistry, which he occupied until 1892, when he was returned to the chair of pharmacy. His failing health was the cause of his being again transferred in the spring of 1896 to a new position, that of professor of technical pharmacy, where his rich experience in manufacturing and analytical work would still be of value to the college, whilst relieving him of the tedium and drudgery of the regular course. Unhappily he never had the opportunity of entering upon the duties of his office.

He enjoyed an uninterrupted service of 29 years as teacher at the college, and was long accounted one of the mainstays of that institution.

Though of a very sympathetic and social disposition his life was lived literally for the good of pharmacy. He never entertained narrow views of his chosen profession, and was identified with all its branches. He was widely known in the circles of sciences allied to pharmacy, and was an active member of the Boston Scientific Society, the Horticultural Society, the Society of Arts, and of the American Association for the Advancement of Science. He joined the American Pharmaceutical Association in 1863, and served as its president in 1875—76. He was a charter member of the Massachusetts Pharmaceutical Association and of the Boston Druggists' Association, and has acted as president of the latter. He was the founder of the Alumni Association, M. C. P., and its first president.

In 1872 he attended the meetings of the British Pharmaceutical Conference in England, and upon motion of the late Daniel Hanbury was elected honorary member of that body. His visit to England was most auspicious, and he made some valued friends across the water. His visit to Europe was repeated in 1878. His honorary membership in many of the pharmaceutical schools and societies of the United States bespeaks the esteem with which he was held here as well as abroad.

In 1891 Dartmouth College conferred upon him the honorary degree of Master of Arts. He has been a member of the committee of revision of the U. S. Pharmacopœia for nearly three decades, having been actively engaged in the revision of the issues of 1870, 1880 and 1890.

From 1873 to 1879 he acted as instructor in materia medica in the Harvard Medical School.

He was always and ever a student, and in his teaching he was sympathetic and ready to help. He was wonderfully quick to see the practical applications and importance of a new discovery, and though fond of theory he was known as an eminently practical teacher. Among all the students who have received instruction from him, we doubt not one but what has a very warm spot in his heart for Professor Markoe. His work as a teacher and his kindness as a man was never shown to better advantage than to those who had the good fortune to be his apprentices during his proprietorship of the Roxbury store.

Mr. Markoe was twice married. In 1866 he was united to Miss Ellen G. Jennes, and one son, George B. Markoe, now in Colorado Springs, Col., was the fruit of this union. Mrs. Markoe died in 1879 and in 1881 he again was married, this time to an English lady, Miss Louise E. Moore. His widow and a daughter, born in 1893, survive him.

TRANSLATIONS.

Reagents and Reactions known by the Names of their Authors.*

Based on the original collection by *A. Schneider*, revised and enlarged by Dr. *Julius Altschul.*

Greshoff's reaction for iodoform. With silver nitrate, iodoform reacts readily with formation of carbon monoxide, silver iodide and nitric acid.

Griess' reaction for nitrous acid.

I. A solution of a salt of m-phenylenediamine produces a yellowish-brown color with nitrous acid. A 0.5 p. c. solution of the base is prepared with the aid of sulphuric acid, sufficient to produce an acid reaction. If the solution is not colorless, it should be decolorized with freshly burnt animal charcoal.

II. A solution of sulphanilic acid and naphthylamine sulphate is colored red by traces of nitrous acid. The solution to be tested is acidified with sulphuric acid, sulphanilic acid solution is added and after a few minutes, solution of naphthylamine sulphate which has been decolorized with animal charcoal. S. *Lunge*.

Griess' reaction for fæcal matter in water is a 1 p. c. solution of diazosulphanilic acid, which has been made alkaline with soda solution. Water containing fæcal matter becomes yellow within five minutes upon addition of this solution.

Griess' test paper is paper saturated with one of *Griess'* reagents for nitrous acid. (q. v.)

Griess-Ilosway's reagent for nitrous acid is an acetic acid solution of sulphanilic acid and naphthylamine.

Guezda's reagent for albumens consists of nickel sulphate and ammonia.

Guenzburg's reaction for free hydrochloric acid in gastric juice. 2 g. phloroglucose and 1 g. vanillin are dissolved in 30 g. alcohol. If a few drops of this solution are evaporated with an equal amount of gastric juice in a porcelain capsule, the presence of hydrochloric acid is indicated by the formation of a red film.

Guignet's reagent is an ammoniacal solution of copper sulphate.

Gunning's test for acetone. If to the solution to be tested (e. g. distillate from urine) tincture of iodine and ammonia are added, iodoform and a black precipitate of nitrogen iodide are formed. The latter gradually disappears and the yellow color of the iodoform predominates. Alcohol in this case does not produce iodoform. (Comp. *Lieben's* reaction).

Guyon's reagent for the detection of aldehydes is obtained if to a solution of 1 g. fuchsine in 1 liter water a mixture of 20 ccm. sodium acid sulphite solution of 30° Bé and 10 ccm. concentrated hydrochloric acid is added.

If 1 ccm. of this reagent is brought in contact with 2 ccm. of the solution to be tested, the presence of aldehyde is indicated by the formation of an intensely purple-red reaction.

This reagent is also known as *Schiff's* reagent.

Gutzeit's test for arsenic. The substance to be tested is transferred to a test tube containing pure zinc and pure dilute sulphuric acid. The mouth of the tube is closed with a piece of filter-paper moistened with a few drops of silver nitrate solution 1:1. The arsenuretted hydrogen formed if arsenic is present produces a yellow spot on the paper, which is blackened upon the addition of water. (See *Flueckiger's* test for arsenic.)

Frohn's reagent for albuminous substances and alkaloids is prepared by boiling 1.5 g. freshly precipitated bismuth subnitrate with a solution of 7 g. potassium iodide in 20 ccm. water and then adding 20 drops of hydrochloric acid. The orange-yellow solution produces precipitates in the acid solutions of albumen and alkaloids.

Hager's reagent for alkaloids is a solution of picric acid, which produces precipitates in alkaloidal solutions. The same solution can also be used as a reagent for albumen by pouring a layer of the reagent over one of the solution (urine) to be tested. In the presence of albumen a turbidity is produced.

Hager's reaction for colchicine. In concentrated solutions of colchicine, a solution of borax produces a white precipitate. In dilute solution the precipitate is not formed at ordinary temperature, but upon heating to 50°.

Hager's test for alcohol in volatile oils. If a grain of tannin is added to the oil it deliquesces to a sticky mass if alcohol is present. If a drop of the oil is poured into water, the presence of alcohol is indicated by the formation of a milky turbidity.

Hager's test for the purity of alcohol (aniline test). 1 g. cacao oil is dissolved in 2 to 3 g. aniline contained in a test tube and set aside for 1½ hours at a temperature of 15° C. If the oil is pure it floats as a clear liquid layer on the aniline. If tallow, wax, stearin or paraffin are present the oily layer shows granular formations or has solidified entirely.

Hager's test for the hydrides of sulphur, arsenic, antimony and phosphorus. The hydrides formed by the action of zinc and sulphuric acid upon the substance to be tested are allowed to act on parchment paper moistened with solution of silver nitrate. If the resulting brown or black spot is macerated with 10 p. c. solution of potassium cyanide, the color resulting from the action of sulphuretted hydrogen disappears at once, that resulting from the hydrides of antimony and phosphorus disappears gradually (1—2 hrs.), that from the arsenuretted hydrogen not at all.

Hager's arsenic test (Kramato method). A hydrochloric acid solution of arsenic or arsenous acids, when heated gently with a strip of copper, produces a permanganate-like spot. Commercial tin or tin-foil can also be used. Comp. *Reich's* test for arsenic.

Hager's test for cholesterin. See *Salkowski.*

Hager's glycerin reaction. If an aqueous solution of glycerin colored blue by litmus tincture is mixed with a solution of borax likewise colored blue by means of litmus, the mixture assumes a red color. Comp. *Linde's* test for glycerin.

Hager's butter test. (Organoleptic reaction.) A cotton wick is saturated with the liquified fat and ignited. After 2 minutes the flame is extinguished. Pure butter develops the odor of strongly fried butter, margarin that of acroleïn.

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* Continued from p. 230.

Hager's test for glucose is a solution of 30 g. red mercuric oxide, 30 g. sodium acetate, 50 g. sodium chloride, 25 g. glacial acetic acid and 400 ccm. water diluted to a liter. If a solution containing glucose (diabetic urine) is heated with the reagent, a precipitate of mercurous chloride results.

Hager's test for potable water consists in the addition of a tannin solution (1 tannin, 4 water, 1 alcohol). Potable water should not produce a turbidity upon standing even for some time.

Hager has devised numerous other reactions which are occasionally referred to by his name. Those not mentioned here can be found in the well-known hand-books of the author.

Haine's solution for the detection of glucose is a solution of 3 g. copper sulphate, 9 g. potassa, 100 g. glycerin in 600 g. water. Glucose (diabetic urine) effects upon the application of heat the precipitation of red cuprous oxide.

Hammersten's reaction for indican in urine. The urine is mixed with an equal volume of fuming hydrochloric acid, solution of chlorinated lime is added drop by drop, and the mixture shaken out with chloroform. The latter takes up the indigo resulting from the indican and is colored blue. An excess of chlorinated lime is to be avoided. This is also known as *Joffe's* test.

Hannstein's aniline mixture for staining microscopic preparations is a mixture of equal parts of methyl violet or fuchsine, or of 1 p. violet and 2 p. fuchsine. For use, a concentrated alcoholic solution of the mixture is prepared.

Hauchecorne's reaction for cotton-seed oil in olive oil. 6 g. oil are heated with 2 g. pure nitric acid ($3HNO_3$ 40° Bé + $1H_2O$) on a water-bath for 20 minutes. Pure oil remains unchanged or becomes lighter. Adulterated oil assumes an orange-brown-red. Pure oil should solidify within 24 hours to a flesh-colored mass. The nitric acid must be free from nitrous acid.

Hefelmann and **Mann's** test for fluorine in beer depends upon the precipitation of fluorides as calcium or barium fluoride. Upon treating the precipitate containing fluorides with sulphuric acid, hydrofluoric acid is formed which is recognized by its glass-etching properties.

Hegler's test for lignin. The sections are covered with alcohol and treated with a dilute alcoholic solution of thallium sulphate. Lignin is colored orange-yellow, whereas cellulose and cork remain colorless.

Hehn's chloral reagent for volatile oils and resins. 100 ccm. of alcohol are saturated with chlorine and the resulting hydrochloric acid partly removed by distillation. Then sulphuric acid is added and the resulting metachloral is distilled. Two drops of the latter when brought together with a drop of certain volatile oils or a fragment of some resins produces characteristic color reactions. (*Dragendorff*, Analysis of Plants.) Oil of myrrh, or the petroleum ether extract of myrrh produces a violet color with the reagent.

Hehner's figure denotes the amount of insoluble fatty acid yielded by 100 g. of fat, and serves for the characterization of fats.

Heinrich's solution for the determination of glucose. See *Sachsse's* solution.

Heller's test for coloring matter from blood. Urine rendered strongly alkaline with caustic potash solution yields upon boiling in the presence of the coloring matter of the blood, a reddish precipitate of the alkaline earth phosphates.

Heller's test for albumen in urine. Urine containing albumen, when poured upon heated nitric acid so as to form two layers, will show a white ring at the zone of contact.

Heller-Teichmann's test for blood. Urine containing blood, when heated to the boiling-point with a drop of acetic acid, forms a brownish-red to blackish coagulate. If to this boiling hot liquid a little caustic soda solution is added, it becomes clear and forms a sediment of earthy phosphates which by the adhering coloring matter of the blood appears red to brownish-red in diffused, greenish in direct sunlight.

Heller's test for glucose. Glucose solutions or urine containing glucose are colored yellow to reddish-brown upon heating with caustic potash. Compare *Moore's* test.

Herbst's aconitine reaction. Upon carefully concentrating a solution of aconitine in phosphoric acid, a dirty violet color is produced in the presence of aconine. Pure, crystallized aconitine does not give this reaction.

Hesse's quinine test for the presence of allied alkaloids. These are less soluble in ether, while their sulphates are more readily soluble in water than the corresponding quinine salt. Shake 0.5 g. of quinine sulphate with 10 ccs. of water of 50°—60° C.; after standing 15 minutes, filter off 5 ccs., add 1 cc. ether (sp. gr. 0.7203) and 5 drops of ammonia water (sp. gr. 0.96). The presence of quinidine, conchonine etc. is indicated by the immediate or gradual formation of crystals in the ethereal layer.

Herapath's quinine reaction. Alcoholic solutions of quinine yield upon the addition of tincture of iodine, crystalline precipitates of quinine iodosulphate. This separates in thin plates, of a green color at ordinary temperatures, brownish-red at 100° C. and possessing strong optical properties. For the microscopical examination of the urine, this, after being rendered alkaline, is shaken with ether, the ether evaporated and a portion of the residue dissolved on the cover glass in a drop of a mixture of 11.25 g. acetic acid, 3.75 g. alcohol, and 6 drops of dilute sulphuric acid. To this is added a small drop of tincture of iodine.

Heydenreich's test for foreign oils (cotton-seed oil) in olive oil. Allow a few drops of the oil to be tested to fall upon some pure sulphuric acid which covers a surface, about the size of a dollar, in a porcelain capsule. In the case of pure oil, the zone of contact is yellowish-green; with oils derived from seeds, it is yellowish-orange to brown.

Heynsius' test for albumen in urine. Boil 5—10 ccs. of the filtered urine with a few drops of dilute acetic acid and then add a saturated solution of common salt. A white precipitate results in the presence of albumen.

Hilger's test for coloring matter from the bile. The coloring matter is precipitated by boiling with barium hydroxide. The yellow precipitate, filtered and washed, gives the following reactions: Upon treating with alcohol and a few drops of sulphuric acid, the precipitate is rendered colorless while the solutions becomes green. If the precipitate is treated with nitric acid containing nitrous acid, green and blue colors result. (See *Gmelin.*)

Himmelmann's arsenic test. See *Marsh's* test.

Hirschsohn's test for acetanilid in phenacetin. 0.1 g. phenacetin are dissolved in 10 ccs. water, the solution filtered after cooling, and treated with bromine water until a yellow coloration results. If the solution becomes turbid, acetanilid was present (formation of p.-bromacetanilid).

Hirschsohn's test for chloral alcoholate in chloral hydrate. 1.0 g. chloral hydrate is tested with 1 cc. nitric acid (sp. gr. 1.38). If at the room temperature or upon warming a yellow color results within 10 minutes, alcoholate was present.

Hirschsohn's test for pine resin in guaiac resin and balsam of tolu. A very finely powdered sample is shaken for 10–15 minutes with 4–5 times its weight of petroleum ether. In the presence of pine resin, an aqueous solution of copper acetate produces a green color in the filtrate.

Hirschsohn's test for fatty oils in balsam of copaiba. 20—40 drops of the balsam are boiled with 1—2 ccs. of a solution of 1 p. NaOH in 5 p. of 95 p. c. alcohol. The presence of oils is indicated by a jelly-like mass separating or a turbidity being produced, upon cooling or by the addition of 2 volumes of ether. Pure copaiba balsam with 3 vol. of 90 p. c. alcohol should yield a mixture from which no oil globules should separate within an hour.

Hirschsohn's test for gurjun balsam in copaiba balsam. 1 vol. of balsam, 3 vol. 95 p. c. alcohol and 1 g. crystallized stannous chloride are boiled together until complete solution results. Admixtures of gurjun balsam are shown by the appearance of a red coloration, changing to blue upon standing.

Hirschsohn's test for gurjun balsam. 2 ccs. of a solution of conc. sulphuric acid in acetic ether (1–5), when added to 3–4 drops of gurjun balsam, causes a violet coloration. For testing copaiba balsam, add 6—8 drops of the balsam to a solution of 2 drops sulphuric acid in 4 ccs. acetic ether. A violet color indicates the presence of gurjun balsam.

Histed's reaction for nataloin. If nataloin is dissolved in conc. sulphuric acid and a small crystal of potassium nitrate be added, a green color is produced, gradually changing to red and then to blue.

Hlasiwetz's hydrocyanic acid reaction. If an alkaline cyanide solution is warmed with picric acid, a blood-red color results.

Hoffmann's reagent for albumens and phenols is a solution of mercuric nitrate containing a trace of free nitrous acid. Yields similar color reactions as *Millon's* reagent. See *Hoffmann's* reaction for tyrosin.

Hoffmann's reaction for chloroform. If traces of ammonium chloride and ferrous chloride are warmed with a saturated solution of alcoholic potash and a few drops of chloroform, then the mixture diluted with water and rendered acid with hydrocyanic acid, a greenish-blue coloration results.

Hoffmann's reaction for phenol. Phenol with concentrated sulphuric acid and potassium nitrate gives a violet coloration.

Hoffmann's reaction for tyrosin. The hot aqueous solution of tyrosin (obtained from the sediment of urine) produces a red colored precipitate upon the addition of a solution of mercuric nitrate with some potassium nitrate.

Hoffmann's test for primary amines. Upon evaporating an ethereal solution of a primary amine base with carbon bisulphide, dissolving the residue in water, and boiling this solution with silver nitrate, mercuric chloride, or ferric chloride, an odor of mustard oil appears.

Hoffmeister's mixture for the solution of cellulose consists of hydrochloric acid with potassium chlorate.

Hofmann's aniline reaction. With fuming nitric acid, aniline gives a deep blue solution, becoming yellow upon warming and finally turning red.

Hofmann's isonitrile reaction for primary amines. These yield upon warming with chloroform and alcoholic potash the characteristic odor of isonitrile.

Hoehnel's reagent for lignin is phenol-hydrochloric acid (a highly concentrated solution of phenol in fuming hydrochloric acid). Lignin is colored green by this reagent.

Holde's test for unsaponifiable substances in fats. Boil a piece of caustic potash the size of a pea in 5 ccs. of absolute alcohol until completely dissolved, add 3—4 drops of the fat to be tested and boil for one minute. Upon diluting with 3—4 ccs. of water, a turbidity indicates the presence of an unsaponifiable substance.

Holde's reagent for tarry constituents of lubricants obtained from petroleum. Dissolve in petroleum ether in which the tarry admixtures are insoluble.

Hoppe-Seyler's test for biliary coloring matter. The urine is precipitated with milk of lime, the excess of lime precipitated with CO_2, the precipitate filtered and washed with water. If nitric acid containing nitrous acid is dropped upon the precipitate on the filter, the well-known color reactions are produced if coloring matter from the bile is present. See *Gmelin*.

Hoppe-Seyler's test for sugar in the urine depends upon the formation of indigo when urine containing grape-sugar is heated with o-nitrophenylpropiolic acid. The reagent employed is a ½ p. c. sol. of this acid in soda lye. 5 ccs. of this solution are boiled with a few drops of urine; in the presence of sugar an indigo color is produced.

Hoppe-Seyler's phenol reaction. A spruce shaving is colored blue when moistend with phenol and hydrochloric acid.

Frommasi's modification: Instead of hydrochloric acid, a mixture of 50 ccs. hydrochloric acid, 50 ccs. water, and 0.2 g. potassium chlorate is employed in the above.

Hoppe-Seyler's test for carbon monoxide poisoning. A few drops of the blood to be tested are mixed in a porcelain capsule with an equal or double quantity of caustic soda solution. In case of poisoning by carbon monoxide, the blood will appear of a vermillion color in thin layers, while normal blood will look a dirty brownish-green.

Horsley's test for glucose. Glucose solutions, or urine containing the same, are colored green upon being boiled with caustic potash and potassium bichromate.

Horsley's test for nitric acid. Pyrogallic acid and sulphuric acid yield a violet color with aqueous solutions containing traces of a nitrate.

Houzeau's ozone-paper is red litmus paper, one half of which has been dipped into a solution of potassium iodide. Since ozone liberates free alkali from potassium iodide, the paper will turn blue in the presence of this gas.

Howie's test for curcuma. 0.3 g. of the powdered rhubarb or insect-powder to be tested are heaped upon filter paper in the form of a cone, 50 drops of chloroform are gradually dropped upon this heap, and after drying and removal of the powder, a small piece of borax is placed upon the spot and a drop of hydrochloric acid added. The appearance of the well known red coloration indicates curcuma. *Maisch's* test resembles this one.

Huber's reagent for free mineral acids is an aqueous solution of 5 percent each ammonium molybdate and potassium ferrocyanide. Mineral acids cause in this solution a red turbidity or a brown precipitate, depending upon the quantity present. Boric and arsenious acids do not give this reaction.

Huebl's iodine number serves for the estimation of unsaturated compounds in a substance (oils, resin and the like), and depends upon the power of these compounds of adding iodine. The iodine number of a substance in the quantity of iodine which 100 parts of the substance will take up.

Huefner's reagent for urea is a freshly prepared solution of sodium hypobromite, made by adding 25 g. of bromine at once to a well-cooled solution of 100 g. of sodium hydroxide in 250 g. of water. This solution decomposes urea into CO_2 and nitrogen, the former being absorbed while the latter is measured in a suitable apparatus (*Knop's* azotometer, *Esbach's* ureometer) and the amount of urea thus quantitatively estimated.

Huehnefeld's turpentine solution for testing for blood. Ten volumes each of oil of turpentine, alcohol, and chloroform, are mixed with one volume of glacial acetic acid, and then water added drop by drop as long as the liquid remains clear. The liquid (urine) to be tested for blood is mixed with a few drops of the turpentine solution and a few drops of tincture of guaiac added. A dark blue coloration of the milky mixture indicates blood.

According to *Schär* the test is applied by adding to the suspected liquid a 1 percent solution of guaiac resin in absolute alcohol, and shaking the resulting precipitate, after filtration, with the above mentioned turpentine solution.

Hume's reagent for arsenious acid is a solution of silver nitrate to which is added ammonia water until the precipitate first formed is just redissolved. Arsenious acid with this solution produces a yellow precipitate.

Huppert's test for coloring matter from the bile. The urine is treated with milk of lime or with calcium chloride and ammonia, whereby in the presence of biliary coloring matter, a yellow precipitate of bilirubin-lime is formed. By means of hot alcohol containing sulphuric acid, this is dissolved to a green solution. After the administration of senna or rhubarb, the precipitate with lime is of a rose-red color; the subsequent solution is orange-yellow.

Husemann's morphine reaction. Morphine is heated with concentrated sulphuric acid and after cooling a drop of nitric acid is added. A beautiful dark violet color results, changing to a blood red and gradually fading.

Jacobsen's test for fatty oils. The fatty oil is brought in contact with rosaniline acetate, which is insoluble in neutral fats but is dissolved by free fatty acids.

Jack's test for sugar in the urine consists in identifying the sugar by means of phenylhydrazine, with which it forms a difficultly soluble osazone.

Jacqemart's reaction for distinguishing ethyl from methyl alcohol. Upon heating ethyl alcohol with a solution of mercuric nitrate, the mercuric salt is reduced and a black precipitate results upon the addition of ammonia. Methyl alcohol does not give this reaction.

Jacquemin's aniline reaction. Upon treating a dilute aqueous solution of aniline with a solution of chlorinated lime and then adding a very dilute solution of ammonium sulphide, a rose-red color appears, even in dilutions of 1:250,000.

Jacquemin's phenol reaction. To the liquid to be tested add some aniline, and then a few drops of a solution of sodium hypochlorite. In the presence of phenol a blue color results, which changes to a red upon the addition of acids.

Jahr's test for determining the melting point of butter. See *Drouot's* test.

Jaffé's test for creatinine. In the presence of creatinine, urine gives with an aqueous solution of picric acid and a few drops of soda lye a red coloration, becoming yellow upon the addition of acids. See also *Weyl's* test.

Johnson's reaction for sugar in urine. Upon heating diabetic urine with picric acid and potassium hydroxide solution, a deep red color appears. To remove other reducing substances, *Johnson* recommends the separation of uric acid and creatinine by means of mercuric chloride; after standing for some time and filtering, the excess of corrosive sublimate is precipitated with ammonia, and the solutions now tested as above mentioned.

Jolles' reagent for acetone depends upon the precipitation of the acetone with phenylhydrazine.

Jolles' reagent for albumen in the urine consists of corrosive sublimate 1.0 g., succinic acid 2.0 g., sodium chloride 1.0 g., water 50.0 g. To apply the test, 4—5 ccs. of the filtered urine is poured into each of two test tubes, 1 cc. acetic acid added to each, and then the mixture shaken up, in one case with 4 ccs. of the reagent, in the other with 4 ccs. of water. By comparison of the two samples, traces of albumen (1:120,000) can be identified. Compare *Spiegler's* reagent.

Jolles' test for coloring matter from the bile. The urine to be tested (50 ccs.) is shaken for several minutes in a glass cylinder with a few drops 10 p. c. hydrochloric acid, 5 ccs. of pure chloroform and a saturated solution of barium chloride. After standing for 10 minutes, the chloroform together with the precipitate is removed by means of a pipette, and the chloroform evaporated off in a test tube on a water-bath. After standing at the room temperature for some time, the watery portion of the residue is decanted from the lumpy precipitate. This latter is distinctly colored even when only 1 p. c. of gall is present in the urine; upon the addition of 3 drops of concentrated nitric acid to which ⅛ vol. of fuming nitric has been added, the characteristic green and blue rings are formed.

Jolles' test for iodine in urine. The urine is tested with an equal volume of hydrochloric acid and a few drops of chlorine water added. In the presence of iodine a brown ring results, which colors starch solution blue.

(To be continued.)

MONTHLY REVIEW.

Commercial Reports.

East Indian Drugs.*

Lawsonia inermis L. (**Lythraceæ**). The leaves furnish Hennah, a dyestuff which has long been a favorite in the Orient. With it the women color the nails of their hands and feet. It is also used for dying the hair, beard and skin as well as for coloring leather. The leaves seem to be put to no important medical use. They are used, however, in dropsy and are applied externally in leprosy, also to wounds and ulcers. Their most important ingredient is probably a tannin of glucosidal character which has been called hennotannic acid. They also contain 2 percent of a resin which is colored green by chlorophyll. The leaves reach a length of 6 cm. and a breadth of 2.5 cm., are acuminate, ovate, narrowed into the short petiole. The secondary veins branch off from the mid-vein at an angle of about 60°. In the outer half they curve toward the top and unite with the next higher vein. The mid-vein has fibres only on the under side. The vascular bundle is bicalatual, the woody part crescent-shaped. The epidermis cells of both sides are rectilinearly polygonal and have stomata. The upper side has two rows of palisade cells, in the spongy parenchyma are two layers of ovalate sacs, very characteristic for this leaf.

Mangifera Indica L. (**Anacaideaceæ**). The ripe fruits with a slight, characteristic turpentine taste, are the mangoes so much esteemed as a fruit in the tropics. When unripe, as are those before us, they serve as an astringent, plainly by reason of their considerable tannin-content. The taste is also somewhat peppery. The single fruits are a few centimeters in size, wrinkled by drying, of a blackish color, the embryo still only slightly developed. In the wall of the fruit are many schizogenetic, secretory reservoirs. The dried flowers, likewise at hand, are also used as an astringent, especially in diarrhoea.

Plantago Ispaghul Roxb. (**Plantaginaceæ**). This plant is native in India and Persia. The species name *Ispaghul* is Indian. Because of the slime present, the seeds of this plant are used internally also when roasted, as a remedy for diarrhoea; externally as an application in rheumatism. The seeds are 3 mm. long, 1 to 1½ mm. wide, pointed, oval, arched on the back, on the front side curved in from the two long sides; in the middle of the furrow so formed is found the small chalaza. The color is a dull, grayish-brown; on the back is an oblong-oval, bright, reddish-brown spot. The epidermis of seed coat on the back side is modified to slime cells, whose content, as is the case with other species, on swelling appears stratified. The seed coat encloses the endosferm in which the small embryo lies. The valuable constituents of this species is the slime contained in the seed coat and it appears that it is here present in especially large quantities. It could otherwise scarcely claim superiority to other species, for example, *P. Psyllium*.

Psidium porniferum L. (**Myrtaceæ**). This plant like all the other species of the genus is a native of America. For a comparatively long time, however, it has for the sake of its palatable fruit been cultivated in the tropics, an undertaking which offers no difficulties on account of the easily germinating seeds. It should also be remarked that botanists regard *P. porniferum* not as a separate species, but only as a form of the guava, *Psidium guayava* Raddi. The root bark and the leaves are before us. Both enjoy in India, the leaves also in the West Indies, a considerable reputation as an astringent, the root bark especially in cases of diarrhoea in children, the leaves as a fever remedy in kidney diseases. They are used externally in rheumatism, also in epilepsy, St. Vitus dance and cramps in children. We know of no especial examination of *P. porniferum*. Probably, however, the plant does not differ materially as to its constituents from *P. Guayava*, the bark of which contains 27.4 percent of tannin.

The leaves have short petioles, reach a length of 12 cm., a breadth of 5½ cm., broad, oval, acuminate, entire, the margin somewhat thickened. Examined with the lens they are translucently punctate. The odor is faint, resembling that of senna leaves; the taste bitter aromatic. The structure shows nothing especially characteristic. Especially around the mid-vein oxalate in sacs and in separate crystals is noticeable. The vascular bundles show near the phloem and xglem parts a layer of bast fibres. In the mesophyll, secretory reservoirs of a type common to the *Myrtaceæ* are found. The bark forms small pieces of a millimeter's thickness, varying exteriorly from greenish-brown to greenish-gray, on the inside light brown. The cross section shows a thin cork composed of three or four layers of flat cells with brown contents. Plainly an abundant cortex formation takes place, since the bast joins immediately onto the cork. The medullary rays are 1 to 2, rarely 3 cell rows wide, the cells radially elongated, 9 to 17 (rarely) cell rows high. The bast rays show a very distinct stratification. One can distinguish tangential layers of crystal-bearing cells which in the dried drug contain much air and, therefore, appear almost black, and layers free from crystals in which the sieve tubes are found. In longitudinal section, two forms of crystal cells are seen; those present in considerable nnmber (as many as 8) one above another containing one crystal each, and more isolated cells containing small crystals in large numbers. In the deeper parts of the bast, one or more narrow zones of small, strongly thickened, pitted, stone cells appear. The bark has no secretory reservoirs. As far as the not entirely clear description of the bark of *P. Guayava* by Dymock (Pharmacographia Indica II, p. 31) allows a conclusion to be drawn, the two agree as was to be expected.

Salvadora oleoides Dcne. (**Salva loraceæ**). This shrubby plant is found in Pendschab and in Afghanistan. Leaves, bark, fruit and oil find medicinal use. The bark of the root as well as the fruit are before us. According to many accounts, they are used in India as a vesicant. This plant is said to have a cress-like odor and a sharp taste. Our specimens lack these characteristics. The pieces are odorless, of weak taste, but distinctly salty. In spite of repeated mastication, no sharpness was noticed. Nevertheless, we believe that the bark before us is genuine since the structure about to be described agrees well with the account given by

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* [Continued from p. 231.]

Dymock (Pharmacographia Indica II, p. 382) and by Moeller (Baumrinden, 126) of the stem-bark of *Salvadora Persica* Garcin. It is, therefore, to be supposed that the above constituents in which the characteristics given consist are of a temporary nature and disappear upon long preservation by which probably the medicinal value is likewise affected. The dried bark contains some alkaloid, its content was found to be 0.109 percent. Tannin is lacking. Dymock attributes the action of the fresh bark to tiomethylamin present. The bark is about 1 mm. thick, exteriorly grayish-yellow with soft cork. In young pieces, the cork is narrow; the cells throughout are thin-walled. Older pieces show abundant cork formation which extends into the bast. The middle bark consists of parenchyma some cells of which contain starch. The medullary rays in the bast reach a width of 3 cells, becoming broader toward the outside, the cells little elongated radially. The bast rays in the younger barks consist exclusively of soft bast with isolated, strongly thickened, much pitted, axially elongated stone cells which in the older barks appear in greater numbers but never united into groups. We, as well as Moeller, could find but few sieve tubes. The fruits are said to act as a diuretic and are used especially in gravel. An oil which they contain is used for rheumatism and after confinement (obviously externally). The oil-content of the fruit is 27.77 percent. The oil is of a grayish-yellow color, with agreeable, mild taste, at usual temperatures solid, melting at 38°. The alkaloid-content of the fruit is greater than that of the root bark; it was found to be 0.58 percent. Unfortunately in both cases, the quantity present was so small that it was impossible to pursue further investigations. The usual reactions for alkaloids (mineral acids alone and in combination with iron chloride, bromine and potassium hydroxide, etc.) give no noticeable results. The fruits are 6—7 mm. long. 4 mm. thick, yellowish-brown to brown, smooth or wrinkled; at the base are found the fruit pedicel, sometimes 2 mm. long, and the remains of the calyx. The fruit covering is thin, papery and brittle and encloses an albuminous seed with thick cotyledons which envelope the radicle.

Soymida febrifuga Juss. (**Meliaceæ**). Indigenous in India and Ceylon. The tree bears the name redwood and in India it is called Rohan, Shem-maram, Chevemanu, Somida-manu. The bark, which is said to have a bitter, aromatic taste, is used as an astringent and tonic and even also as a substitute for Peruvian bark in intermittent fevers, in diarrhoea and dysentery. There have been upon the market in the past various sorts of bark purporting to belong to this tree. This is evident since the descriptions which lie before us, as far as they concern the anatomical features of this drug, differ very considerably from one another as well as from the bark under immediate consideration and from a specimen coming from the pharmacognostical collection of the Polytechnicum at Zuerich. The descriptions by Moeller (Baumrinden, p. 264) and by Lanessan in the Remarks upon the French translation of Flückiger and Hanbury's Pharmacographia (II, p. 304) plainly agree. We can give only the most important data. The cork consists of cells thickened on the inner side and of flat cells not thickened. The primary bark is only preserved in part. Many of its cells enclose oxalate sacs (according to Lanessan *gros cristan mamelonnes d'oxalate*). The bast is composed of layers of soft bast and fibre groups. The cells of the latter are much compressed, the groups ensheathed by the glandular cells. The medullary rays may contain as many as five cell rows, glands seldom present. The description in the Pharmacographia itself says nothing about bast fibres, on the other hand, it mentions slime cells and also oxalate crystals, whether gland or single crystals, is however not designated. The bark tastes bitter and astringent.

Dymock gives about the same description in the Pharmacographia Indica (I, p. 338). He calls the oxalate crystals, however, expressly "star shaped" as they probably glands. The bark examined by us from the collection spoken of differs again from this. The pieces are about 1 cm. thick covered on the outside with black-gray bark. Where the cork has broken off flat caritics appear plainly, (*Conchas* of the cinchora barks). Beneath, the bark is reddish-brown, inside light brown, striate. Fracture short fibrous. The cross section shows obliquely radial and, especially in the inner half, tangential striations. The cork consists of flat, uncompressed cells. It borders toward the inside very immediately upon the bast. Where any of the primary bark still remains, it consists of parenchyma cells with brown contents. Numerous cells contain oxalate crystals and moreover single crystals in preponderance, seldom glands. The bast is plainly stratified. The fibre-bundles extend out over the narrow bast rays. Its cells are much thickened and show plainly the primary membrane. The bundles are ensheathed by septate fibres; their cells contain single crystals. In the soft bast small groups of obliterated sieve tubes are to be found which as far as can be ascertained, have simple, obliquely-placid sieve plates. The medullary rays are about 5 cells in width and 50 high, the cells elongated radially, free from crystals. The cells of the soft bast, on the other hand, contain numerous single crystals. The bark has a bitter, astringent taste. It quickly colors water reddish-brown and contains much tannin green with ferric salts.

The differences between this bast and the first named are not very weighty. They appear to lie especially in the cork and the crystals so that it probably comes from a related plant.

Quite different from all that have been mentioned and very characteristic is the bark which has recently reached us. It consists of pieces reaching 6 cm. in length, 5 cm. in breadth and 2 cm. in thickness which are covered on the outside with gray, fissured cork. Where this is cracked off, the bark shows a brown color with marked violet tinge. On the inside it is dark, red-brown, finely striated. The taste is astringent, aromatic, burning. The watery extract is slightly yellowish and contains abundant tannin turning iron salts blue. In the cross section, the bark shows scant striations and brighter spots. The cork consists of rather long cells much thickened on the side and inner walls. The primary bark shows radially elongated parenchyma cells, some with reddish-brown contents, some with starch in small, round grains. The primary bark contains as a very characteristic feature, groups of radially elongated, pitted stone cells not strongly thickened. These cells are also found in the outer parts of the bast which contain besides, small groups of much thickened, short, curved fibres. Besides the fibres with tapering ends, those occur which are especially short and are bluntly cut off at the ends. They may be designated as "staff-cells" (Stabzellen). The fibre-groups are surrounded by cells with single crystals. The medullary rays reach a width of 3 cell rows and a height of 50 cells; the cells are but little elongated radially. They have brown contents as have the cells of the primary bark. Aside from other differences, this newest bark introduced as *Soymida* is markedly characterized by the violet color and the sclerenchyma groups of the primary bark.

We believe that of the above briefly described barks, that mentioned by Dymock is in greatest probability genuine without, indeed, being able to give other grounds than that Dymock in India would be able most easily to decide concerning the genuineness of the barks described by him.

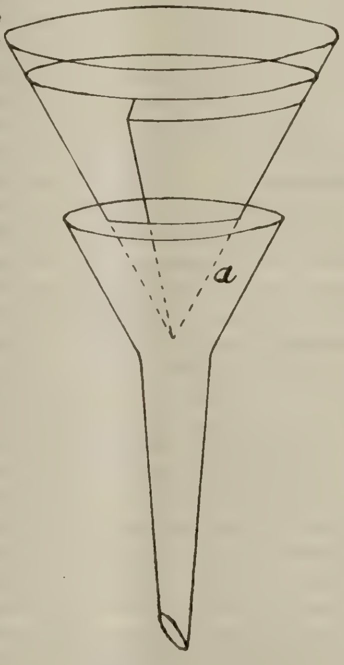
We have discussed this in itself perhaps never conspicuously valuable drug thus more fully than was really the purpose of these lines in order to show how far often the foreign drugs coming to us under a like name differ from each other and how important it is to determine them in the beginning pharmacognostically.

(To be continued.)

Pharmaceutical Technique.

New Funnels.

A new funnel for analytical purposes has been suggested by Rob. Muencke.[*] The apparatus can readily be understood from the accompanying cut without further description. The advantage consists in the fact that that part of the filter with which the precipitate primarily comes in contact does not at all come in contact with the wall of the funnel, but projects free into the lower, wider portion. This increases the rapidity of filtration very greatly. It is claimed that there is no danger as far as tearing of the filter is concerned.

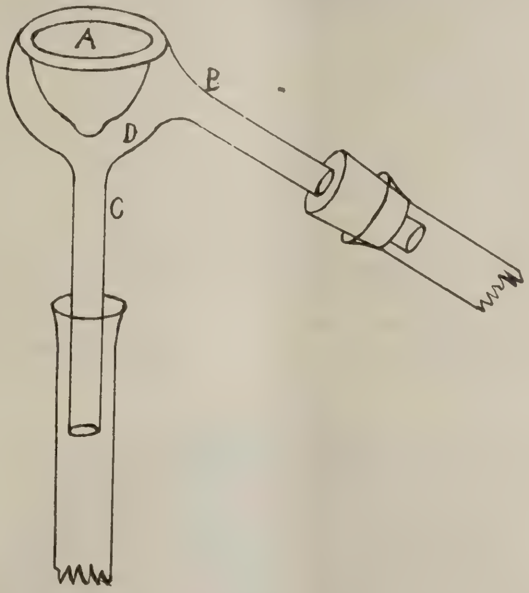


Celluloid filters are recommended by A. H. Edwards[†] for the rapid filtration of larger quantities of liquids. He uses semi-circular celluloid plates with sieve-like perforations. These are bent to assume funnel shape and are suspended from the ring of a retort stand. The extemporized funnel is lined with filter paper. Inasmuch as the filtrate can flow out of the numerous perforations, the rate of filtration is greatly increased.

[Zeitsch. f. anal. Chem. 35, p. 560; *from Pharm. Centrh. 36, p. 94; and †from Chem. News, 71, p. 40.

A New Condenser.

For distillation from a test-tube C. J. Brooks has devised a new condenser represented by the accompanying figure. From the slanting test-tube the vapors rise through tube B into chamber D with the cup shaped cooler A, which contains the cooling medium. The condensed liquid flows through tube C into another test-tube held below.



[Zeitsch. f. anal. Ch. 35, p. 553; from Chem. News, 70, p. 239.]

The Metric System.

The following abstract from Prof. Mendenhall applies equally well to many druggists in particular as to people at large.

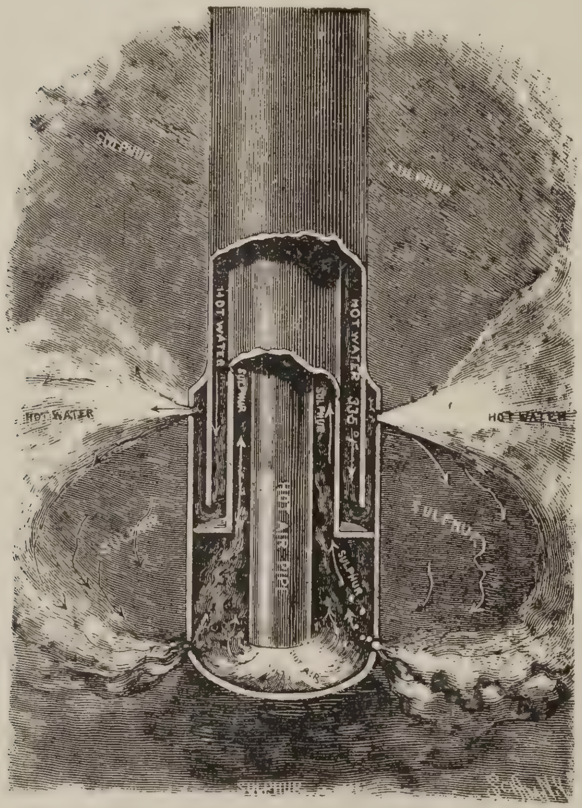
As Mr. Spencer begins by declaring that the advocates of the metric system allege that all opposition to it results from ignorant prejudice, which he very properly declares is far from true, it may be well to say that, in the opinion of the writer, there is relatively little of that sort of thing to contend with in the United States. What is far more dangerous as an obstacle to human progress, and often far more common, is what may be called "intelligent prejudice," meaning thereby an obstinate conservatism which makes people cling to what is or has been, merely because it is or has been, not being willing to take the trouble to do better, because already doing well, all the while knowing that doing better is not only the easier, but is more in harmony with existing conditions. Such conservatism is highly developed among English-speaking people on both sides of the Atlantic, and is likely to turn up in the most unexpected places. It is often a phase of ancestral or national pride, and finds its expression in the feeling that whatever pertains to one's own race or country is, on the whole, better than anything else of its kind. Those who are under its influence are adepts in finding ingenious reasons and excuses in defense of an attitude toward reform which they must know to be founded on neither logic nor fact. These people are numerous among opponents of reform in coinage, weights, and measures, and, as already noted, it is with this class that the most serious difficulty is encountered. "Ignorant prejudice" generally disappears when ignorance disappears, and fortunately in the present instance the system which it is proposed to substitute for that already in use is so extremely simple that it can be learned and understood in a few minutes.

[Appleton's Popular Science Monthly, 49, p. 721.]

Chemistry.

The Louisiana Sulphur Wells.

Some time ago statements appeared in various journals and papers with regard to sulphur mines in Louisiana, and a new mode of mining sulphur buried under from four to five hundred feet of quicksand. J. B. Franckhauser in an illustrated article describes the new method. After briefly reviewing the attempts of 1870 in Calcasien Parish, La., of sinking immense cylinders of steel, and later attempts of freezing the quicksand, he describes somewhat more in detail the present method which appears to contain the elements of success.



The new device originated with a Mr. Herman Frasch, of Cleveland, and is modeled after the mode of operating salt wells. Hot water, at a temperature of 335° F. and under a pressure of from twelve to fifteen atmospheres to prevent it from being converted into steam, is poured into the well. Coming in contact with the sulphur, this is melted, forced back into another chamber of the treble pipe, as is indicated by the accompanying cut, and raised to the surface. The machinery once started, operations proceed until steam is blown off from the top of the pipe, in which case no more sulphur can be melted in the well, at least for the time being.

This may take from several hours to several days. The sulphur thus obtained is, when it reaches the open air, of a dirty, dark brown color. It flows into large shallow vats, is allowed to cool for eight or ten hours, crystallizes meanwhile, and is then sawed into blocks of convenient size. From some of the wells a product containing 99 p. c. pure sulphur was obtained, showing that the new process is likewise one of purification. Inasmuch as iron is acted upon by sulphur and aluminium alone would not be strong enough to support the required pressure, steel pipes coated with a heavy layer of aluminium are used.

[Scientific American 75, p. 280.]

Distribution of Glutamine in Plants.

Inasmuch as asparagine occurs widely distributed in nature, it was assumed by E. Schulze that this might be equally true of its next homologue, glutamine. The extract of the plant is purified by means of basic lead acetate and the amide precipitated with mercuric nitrate. The precipitate is decomposed by means of hydrogen sulphide, the solution neutralized with ammonia and evaporated to crystallization at a temperature of 50—60°. The resulting crystals of the amide were sometimes contaminated with those of asparagine, tyrosine or arginine nitrate. These, however, can be separated according to methods suggested in the original. The presence of glutamine in a considerable number of plants was thus demonstrated. The author is of the opinion that glutamine plays a similar rôle in plant economy as does asparagine, and that the one can replace the other. [Ber. 29, p. 1884.]

Arsenate of Lead, a New Insecticide.

This substance has been recommended as a substitute for Paris green in spraying mixtures used for the destruction of "biting" insects, such as the apple worm (Codling Moth) and the Plum Curculio. Being insoluble in water, and reported as non-injurious to foliage, it is held that it may with safety be employed in larger amounts than those given in the formulæ containing Paris green; at the same time it is said that this compound is equally as efficacious in the extermination of insect foes as the latter.

The compound can be prepared according to the following equation:—

$$2Na_2HAsO_4.7H_2O + 3Pb(C_2H_3O_2)_2 = Pb_3(AsO_4)_2$$
$$4NaC_2H_3O_2 + 2HC_2H_3O_2 + 14H_2O.$$

To prepare 50 gals. of the mixture at the rate of 1 ℔ of lead arsenate to 200 gals. water, 3 oz. of arsenate of soda and 4¾ oz. of lead acetate are dissolved each in a quart of water. Both solutions are poured into a barrel containing about 45 gals. of water. The mixture is well stirred and finally made up to 50 gals. This formula provides for the presence of a slight excess of lead acetate in solution. If arsenate of soda were in excess, injury would probably result to the foliage. The compound is precipitated from very dilute solution in order to secure a fine precipitate which will remain longer in suspension.

[Report Exp. Farms of Canada for 1895, p. 220.]

Action of Ferric Chloride on Gold.

P. C. McIlhiney has made a number of experiments which lead him to the conclusion that hydrochloric acid in presence of air is without action on metallic gold, that ferric chloride is without action on gold unless oxygen is present, but that ferric chloride acts as a very efficient carrier of chlorine in the presence of hydrochloric acid and oxygen. This fact helps to account for the solubility of gold in mine waters and in other waters containing iron, acid and common salt.

[Am. Journ. of Sc. 152, p. 293.]

Botany and Pharmacognosy.

Saffron in Spain.

The British consul at Malaga is informed that the price of saffron seed varies in proportion to the price of saffron itself. The ground is lightly prepared in August to a depth of 15 cm., the seed planted about 8 cm. deep, in rows 20 ccm. apart, with 1 or 2 cm. between the seeds. There is no fruit until the second year, and after the sixth year it is customary to renew the plantation. Gentle hoeing is necessary in summer, and the soil must be loosened with a special tool before the plants are moved at the end of September. Soil in which the plant grows for the first time gives the best result and the richer the soil, the better the return. The flower is picked during the latter half of the month of October, and the product, after drying on low sieves over a slow fire, is divided into nine classes, the prices of which vary according to the quantity of each class that the crop yields and the demand for the same.

[Pharm. Journ. 57, p. 64.]

The Kosotree in Usambra.

Flores Koso, the well-known anthelmintic of the drug-store, is derived from a rosaceous tree: *Hagenia abysinnica* Willd (also known as *Brayera anthelmintica* Knuth). For a long time this tree was known to grow only in Abysinnia, from which country it derives its species name. Later it was found also on the Kilimandscharo, where it grew at an altitude of from 1400 to 2800 meters. Recently it has also been found by Dr. Buchwald near the source of the Kwasinde in Usambra. It grows along the boarders of woods in clearings at a height of 1700 m. The possibility of exporting the drug from the German colony is suggested.

[Die Natur, 1896, p. 423; from Notizbl. d. kgl. bot. Gart. u. Mus. zu Berlin, No. 5.]

Adulteration of "Sandmandelkleie".

G. Marpmann has investigated two specimens of Sandmandelkleie from widely differing sources with interesting results. One specimen contained 62 percent ash and 30 percent organic matter. The ash consisted for the most part of pure diatomaceous earth of the type characteristic for the "Lüneburger Heide." The organic substance was mainly wheat flour with a small content of Mandelkuchenmehl and was perfumed with cumarin. The second specimen differed mainly in the source of the diatomaceous earth, this coming from the region of the Danube. The ash in this case made up only about 30 percent.

The genuine Sandmandelkleie consists of about 10 percent of finest sea sand which has been treated with hydrochloric acid to remove fragments of shell, etc., and of pure flour or Mandelkuchen. This preparation cannot be injurious to the most delicate skin. The diatomaceous earth, on the other hand, consists in great part of slender, pointed and often angular bodies which cannot but be injurious when rubbed into the epidermis.

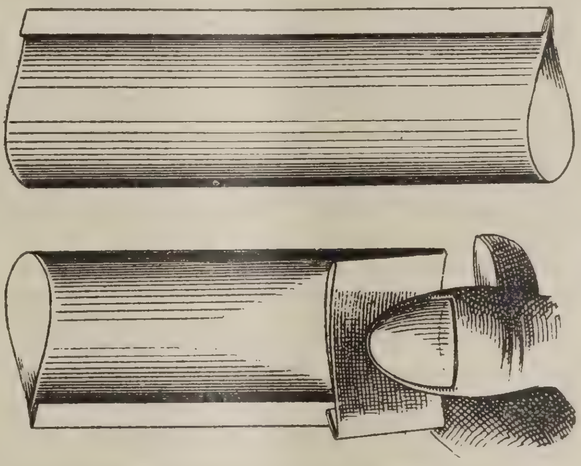
[It appears that the use of diatomaceous earth in this preparation is usual, since in the Real-Encyclopædie der Pharmacie 9, p. 36, both diatomaceous earth and sea sand are mentioned in this connection.]

[Zeitschr. f. angewandte Mikroscopie, 2, p. 10.]

Practical Pharmacy.

Oval Folded Powder-Papers.

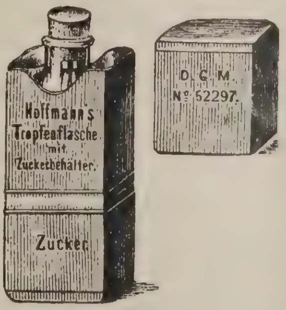
A new form of ready folded powder-papers (Falzcapseln) has recently been patented by E. Siegemund, Hirschberg in Schlesien, Ger., which does away with the objectionable blowing into generally practiced in opening the ordinary folded powder-papers. As seen in the accompanying cut, these papers differ from similar ones in being folded on one side only, and thus being kept open by the elasticity of the paper itself.



A Pocket Medicine Case.

A very convenient pocket case for carrying small quantities of medicine has recently been patented and placed upon the market by Georg Hoffmann, Apotheke z. Storch, Dresden, Pillnitzerstrasse. The case, of which the accompanying cut gives a good idea, is made of nickelled tin, and is of such a size as to be easily carried in the pocket.

For carrying medicines intended for internal administration, of which only small doses are to be given, one half of the case is taken up by a small bottle, while in the other are lumps of sugar with which the medicine is to be taken. For carrying tooth-ache drops, Turlington's balsam etc., the sugar is replaced by absorbent cotton or by cotton and strips of adhesive plaster.



Rose-Geraniol.

It is generally known that in Turkey the yield of oil obtained from rose petals is increased by sprinkling the petals with palmarosa oil before distillation. This adulteration was ingenious, for as Schimmel & Co. have shown geraniol is quantitatively the most important constituent of both palmarosa and rose oils. This firm has recently introduced under the above name a product obtained by the distillation of rose petals with pure geraniol. The introduction of those constituents which impart the peculiar flavor to palmarosa oil are thus not given to the so-called rose-geraniol, but this resembles the true rose oil much more than the Turkish product. Another difference is that the rose-geraniol is not sold as rose oil, but as a distinctively artificial product.

At first a product was obtained by distilling 500 parts of rose petals with 1 p. of pure geraniol. This according to a circular was termed "Rose-Geraniol, Saturated." The product obtained by distilling 1000 p. are petals with 1 p. geraniol according to the same circular is termed "Rose-Geraniol, Extra Saturated." According to the latest report this "tausendfaches Rosen-Geraniol" has a sp. gr. of 0.876 at 25° and congeals at + 13.5°. The "zweitausendfünfhundertfaches Rosen-Geraniol," obtained by distilling 1 p. of geraniol with 2500 p. fresh roses, has a sp. gr. of 0.872 at 25° and congeals at + 17.5°. This seems to verify the claim that the new article, which is to become a competitor of Turkish oil, is "scarcely distinguishable from pure otto of roses." [Inasmuch as both sp. gr. and congealing point of the latter product fall within the requirements of the U. S. P. it is to be hoped that there still remains some method by means of which the rose-geraniol can be distinguished from the genuine oil after it has passed through the hands of several intermediaries.]

[Schimmel & Co. Bericht, Oct., 1896, p. 66.]

Literary.

Books and Pamphlets Received.

Bibliographisches Institut–Leipzig. Meyer's Conversations-Lexicon. Ein Nachschlagewerk des Allgemeinen Wissens. Fünfte, gänzlich neubearbeitete Auflage. Mit circa 10,000 Textabbildungen, 1000 Bildertafeln, Karten und Plänen. 13. Band. Nordseekanal bis Politesse. 1060 Seiten. 1896.

——Geschichte der ältesten Litteratur von den ältesten Zeiten bis zur Gegenwart. Von Prof. Dr. Richard Wuelkner. Ein Bd., pp. 632. Mit zahlreichen Illustrationen. 1896. $5.00.

Lea Brothers & Co. — Philadelphia. The Students' Dictionary of Medicine and the Allied Sciences. Comprising the pronunciation, derivation and full explanation of medical terms, together with much collateral descriptive matter, numerous tables, etc. With appendix. By Alexander Duane, M. D. One vol., pp. VIII, 679.

—— Ptomaïns, Leucomaïns, Toxins and Anitoxins: or, The chemical factors in the causation of disease. By Victor C. Vaughan, Ph. D., M. D., and Frederick G. Novy, Sc. D., M. D. Third edition, revised and enlarged. One vol., pp. XII, 604.

Julius Springer — Berlin. Vierteljahresjahresschrift über die Fortschritte auf dem Gebiete der Chemie der Nahrungs- und Genussmittel. Unter Mitwirkung von Fachgenossen redigirt von Dr. A. Hilger. Elfter Jahrgang. Das Jahr 1896. Zweites Heft. pp. 161—310. 1896.

C. W. Kreidel's Verlag—Wiesbaden. Naturwissenschaftliche Einführung in die Bakteriologie. Von Dr. Ferdinand Hueppe, Professor der Hygiene an der deutschen Universität zu Prag. Ein Bd., pp. VIII, 268. Mit 28 Holzschnitten im Texte. 1896. M. 6.00.

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Georgia Agr. Exp. Station—Atlanta. Commercial Fertilizers and Chemicals, inspected, analyzed and admitted for sale in the State of Georgia up to Sept. 1st, 1896, and other information in regard to fertilizers. By Dr. George F. Payne, State Chemist. Bulletin No. 32, pp. 132. 1896.

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Author—The Achievements of Physical Chemistry. Address by Vice-President W. A. Noyes, before the Section of Chemistry, Am. Assoc. for the Adv. of Sc. at the Buffalo Meeting, Aug., 1896. From the Proc. of the A. A. A. S., vol. 45. Pamphlet, pp. 17.

Schimmel & Co.—Leipzig. Bericht, October, 1896. Pamphlet, pp. 110, with a map.

Authors—Ueber Borsäure und ihre Salze. Von Louis Kohlenberg und Oswald Schreiner. Separat-Abdr. aus Zeitsch. f. phys. Chem. 20, No. 4. Pamphlet, pp. 22. 1896.

Author — Presidential Address at the thirty-third annual meeting of the British Pharmaceutical Conference at Liverpool. By William Martindale. Pamphlet, pp. 15. London, 1896.

Author—Liverpool Revisited. An illustrated guide to the proceedings of the British Pharmaceutical Conference at Liverpool. Reprinted, with additions, from the Pharmaceutical Journal. Pamphlet, pp. 48. 1896.

Schering and Glatz—New York. 1) Creosote Carbonate in the treatment of pulmonary tuberculosis. By Dr. W. H. Dukeman. 2) A contribution to the study of the therapeutic employment of creosotal. By Dr. S. Reiner. 3) Medicated Kefir. 4) Guaiacol Carbonate as a substitute for creosote in phthisis. By Dr. M. Green. Reprints from medical journals. Pamphlet, pp. 15. 1896.

Reviews.

The Student's Dictionary of Medicine and Allied Sciences. Comprising the pronounciation, derivation, and full explanation of medical terms, together with much collateral descriptive matter, numerous tables, etc. With appendix. By Dr. Alexander Duane, Assist. Surgeon to the N. Y. Ophthalmic and Aural Institute; Reviser of medical terms for Webster's International Dictionary. Lea Brothers & Co., Philadelphia. One vol., pp. VIII, 679. $3.00. 1896.

The object of the author has been "to give sufficient but succinct information concerning every word that the student or physician will be likely to meet with in the course of his professional reading." In order not to render the work too voluminous for the means of the average student, obsolete words have been carefully omitted. "Practical utility rather than historical tradition has controlled the selection of matter."

That there appears to be a demand for such a work seems to be indicated by the call for a new edition. The publishers have recently accompanied the announcement of this new edition by calling attention to the reduction in price which was made possible.

The work is planned on the alphabetical arrangement of a series of major titles or primes, each beginning a separate paragraph and printed in heavy type; and of a series of subordinate headings placed in the body of the paragraph. This arrangement has enabled the crowding of a great amount of matter into a comparatively small space. Yet the pages are by no means overloaded and the judicious use of heavy type makes orientation quite easy. The numerous tables add largely to the value of the work. All told the volume contains a remarkable amount of information for its size and certainly ought to be within the means of every student. *E. K.*

Meyer's Conversations-Lexicon. Ein Nachschlagewerk des allgemeinen Wissens. Fünfte, gänzlich neubearbeitete Auflage. Mit circa 10,000 Textabbildungen, 1,000 Bildertafeln, Karten und Plänen. 13ter Band. (Nordsee Kanal bis Politesse). 1060 Seiten. Verlag des Bibliographischen Institutes. Leipzig und Wien. 1896.

Der dreizehnte Band dieser vorzüglichen Encyclopaedie ist textlich, wie durch die grosse Anzahl von Farbendruck und anderen Abbildungen und Karten von besonderem Interesse und grosser Schönheit. Der Band ist auf allen Wissensgebieten reich an grösseren Artikeln, besonders auf geographischen und naturwissenschaftlichen. Von letzteren mögen folgende erwähnt werden: Orchideen, Orientalische Fauna, Palmen, Pferd, Pflanzen, Pflanzenverbreitung, Pflanzenkrankheiten, Pflanzenornamente, Pflanzenzelle, Phosphor, Pilze, Planetensystem, Polarisation, Polarlichter. Grössere Artikel technischer Art sind: Oefen, Panzerschiffe, Papier, Photographie, Photometrie. Für unsere Leser sind auch von speciellem Interesse die Artikel: Patent, Patentrechte, Patentgesetze, Pharmacognosie, Pharmacie, Pharmacologie, Pharmacopöen, Physiologie. Der Artikel über Pharmacie ist, wenn auch sehr knapp, doch gut geschrieben. Nur auf dem Gebiete der allgemeinen und der periodischen Fachliteratur ist der Artikel unzureichend und ohne genügende Kenntniss der letzteren verfasst.

Das Meyer'sche Lexicon hat sich auf seinem Felde in deutscher Sprache bekanntlich den Weltmarkt längst erobert. Es ist von Auflage zu Auflage an Umfang gewachsen und inerhaltlich vollendeter geworden. Der erstaunliche Fortschritt der Kunsttechnik allein wird in überraschender Weise zur Anschauung gebracht, wenn man die Bände der älteren Auflagen dieses Conversations-Lexicons mit denen der fünften Auflage des Jahres 1896 vergleicht. Dies gilt auch für den gesammten textlichen und vor allem für den illustrativen Inhalt des Werkes, welches in dieser Beziehung wohl unerreicht darsteht

Das prompte Erscheinen des Lexicons führt dasselbe seiner baldigen Vollendung schnell entgegen. *Fr. H.*

Geschichte der englischen Litteratur von den ältesten Zeiten bis zur Gegenwart. Von Prof. Dr. Richard Wülker. (*History of English Literature from ancient times until the present.*) One large vol., pp. 632, with 25 chromo plates and engravings, 11 facsimile prints and 162 illustrations. Published by the Bibliographisches Institut, Leipzig and Wien. 1896. Price, half leather, $5.00.

This masterly written and magnificently illustrated work is the first treatise in either the German or the English languages, which may well claim to be a complete scientific history of English literature. None of its many predecessors fulfills so well the requirements both of science and of modern literary taste. The advantage of the book is that it thoroughly represents the entire development of English literature; this is evident from the fact that the book begins with the times preceding the arrival of the Anglo-Saxons, giving even a short sketch of Celtic literature. Anglo-Saxon literature is treated just as fully as English literature proper. This had to be done in order to demonstrate how early some of the characteristics of the British mind became prominent and how they were developed in the course of centuries. Among these traits are the predelections of the English people for the drama and the novel and their inclination towards serious religious themes and poetry descriptive of nature. Nor does the book fail to prove that humor, which evidently is not yet extinct in England, already appeared in early times—as for instance in Chaucer's works, to which much space has been devoted.

A great merit of the author of this standard work lies in the precise and lucid representation of the vast material that had to be gone over; this advantage combined with a graceful style makes it a work that is not only strictly scientific but at the same time interesting and attractive to an educated public. The author has well succeeded in giving the book as much as is compatible with its strictly scientific aim a popular character. As most readers cannot well be familiar with all the older literature mentioned in the book, Prof. Wülker has with good taste and discrimination added a sketch of the contents of the more important works and has selected a large number of characteristic quotations well translated into German.

The popular and entertaining character of the work has largely been increased by an abundance of splendid illustrations, largely true works of art, which have not been copied from preceeding literature but are exclusively reproductions from earlier or from contemporaneous pictures, drawings, documents etc. Among the most interesting and valuable of these excellent reproductions are: the coronation of King Henry IV of England, the bust of William Skakespeare in Trinity church in Stradford, a company in Tunbridge Wells including Dr. Johnson, Cibbar, Garrick, Pitt, Richardson and others, the fall of the evil angels (from an Anglo-Saxon Manuscript), places where Shakespeare has lived, and many fac-simile reproductions of the most famous poets of England. All these colored plates and other illustrations are masterpieces of the highest types of modern reproductive art.

Prof. Wülker's History of English Literature ranks foremost among this class of books of our time; it will command a place in every well appointed public and private library. Its comparatively low price makes it readily accessible to every family and every student and friend of literature. The book is a great credit to its author and publishers and is specially suited for, and of paramount and enduring value as a Christmas or New Years present. *Fr. H.*

Ptomaïns, Lencomaïns, Toxins and Antitoxins: or The chemical factors in the causation of disease. By Dr. V. C. Vaughan and Dr Fr. G. Novy, Professor and Junior Professor, respectively, of Hygiene and Physiological Chemistry in the University of Michigan. Third edition, revised and enlarged. One vol., pp. XII, 604. Lea Brothers & Co., Philadelphia. 1896.

The fact that the first edition published in 1888 was succeeded by a second in 1891 and a third in April of this year may be considered complimentary to the authors and such it is. It, however, implies much more. Not only was there a need for a book of this kind, but the growth of the book indicates that the revisions came none too often.

The bacteriological and chemical explanation of disease is possibly doing more than any thing else to take medicine from its old empirical basis, on which it still rests to no small extent, and make it truely scientific in a modern sense of this term. A chemical explanation of the animal functions, both normal and pathologic, is not new in itself, yet our knowledge of the chemistry of even the normal functions of the human body must be meagre. This condition must last as long as the chemistry of the so-called albuminoids and related substances is shrouded largely in darkness. This explains why the physiological chemist gropes almost in utter darkness when he tries to explain chemically the processes that take place during the formation of toxins, antitoxins, and their action on each other both in the testtube and in the human organism. As long as our chemical knowledge of these substances is itself almost *nil* nothing else can be expected.

It was quite different with some of the so-called ptomaïns and lencomaïns. It was not a matter of very great difficulty to identify some of the former class with the polymethylene diamines and with derivatives of trimethylamine. A fair knowledge of the chemistry of these bases had prepared the way for a better understanding of these substances as soon as their basic character had been recognized and methods for their isolation had been devised. The result is that we are largely independent of herring brine and decomposed corpses in the preparation of these substances, while the commercial toxins and antitoxins are comperable to our crude galenical preparations, most of which cannot be assayed chemically or even identified by chemical means.

The terms ptomaïns, leucomaïns etc. are not, strictly speaking, chemical terms. They have no place in chemical classificatian except in sorting the rubbish of the chemical lumber-chambers. Like the term alkaloids, terpenes etc. they loose their chemical significance in the same degree as our knowledge of the chemistry of these substances advances.

Our chemical lumber-chambers may never be thoroughly cleaned and thus be abandoned. Excellent work along this line, however, has been done during tne last decade and those who are busy in this work deserve the thanks of humanity fully as much as those who are active in fields that have been longer and better cultivated. The work before us has been one of the most prominent, certainly in American literature, along this line. The coupling of the names of Vaughan and Novy have almost become household words with the physiological chemist, the bacteriologist and the physician of this country. To enter into the detailed discussion of the book would, therefore, be entirely superfluous. The historic character is maintained in the third edition, the bibliography is brought up to date as well as the contents of the body of the book. This edition, like its precursors, will no doubt go forth to do good missionary work: to spread the study of disease from a modern scientific stand point. *E. K.*

Vierteljahresbericht über die Fortschritte auf dem Gebiete der Chemie der Nahrungs- und Genussmittel, der Gebrauchsgegenstände sowie der hierher gehörenden Industriezweige. Mit der Redaction beauftragt: Dr. A. Hilger. Elfter Jahrgang. Das Jahr 1896. Zweites Heft. Verlag von Julius Springer. 1896.

This quarterly which is edited by four specialists aided by fifteen more makes its appearance with regularity and keeps abreast with the times. Its regular and prompt appearance makes it an invaluable aid to the food chemist who can neither afford to wait for yearbooks nor keep a host of chemical journals. Even to those who have access to most of the important journals a quarterly classification of the literature is of greatest importance. That the work is well done goes almost without saying. *E. K.*

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EDITORIAL.

Appearance and Reality in the Professional and Commercial Position of German Pharmacy.

Public opinion abroad, concerning the condition of pharmacy and the solidarity of the profession of pharmacy in Germany, still very largely rests upon the traditions of the "good old times", i. e. of the first half of this century. Even the small number left to-day of those older veterans of German pharmacy, who have brought respect and influence to their profession in a foreign country, by proficiency and force of character, belongs to a movement of immigration that occured about and just after the middle of the present century. With the departure of those representatives of the flowering time of German pharmacy, who have become masters through severe schooling, the old ideals have vanished more and more, especially in the United States; the immigration that has followed has long since been found to be less valuable, and so the predominance of the German in pharmacy in America has gradually lost its former significance. The nimbus which at one time surrounded the "deutsche Apotheke" has become visionary, although the myth about German pharmacy flourishing in comfortable security and opulent prosperity under state control has remained, and it is still often considered the enviable image of pharmaceutical perfection and happiness. To this illusion also the words of the poet may apply:

> "Was vergangen kehrt nicht wieder,
> Sank es leuchtend nieder,
> Leuchtet's lange noch zurück."

In reality the prestige which German pharmacy still retains in foreign countries no longer lies in the German apothecary shop but is due to its scientific representatives who generally work and produce outside of the pharmacy. The array of German scientific literature that has never faded and is always rejuvenated, far outshines the large substratum of that contingent of German apothecaries subsisting in the servitude of capital and creditors, and of the apothecary's profession in general as it rests on a volcano of illusory rights and privileges in industrial and commercial misery. The profession and the drug trade in its struggle for existence are lost sight of abroad, on account of the splendid productions that are continually sent out by German scientific publications and by the quiet labors of German university teachers.

In the volumes of this journal the traditional ideal aspects of German pharmacy have occasionally been held to view and lauded with more piety than the facts fully warranted, and the reverse and realistic view was left out of sight. However in the October number of the year 1895 (p. 229) the commercial and industrial condition of the German pharmaceutical profession at that time was briefly discussed. Among other things the following was said:

"That part of the German pharmaceutical profession holding property which is to a great extent heavily encumbered, desires either a continuation of its vested rights and sole privileges or a repeal of the same, and in either case views quite contentedly the current that is now apparently drifting towards discontinuation of special privileges. The uncertainty and consequent long felt pressure upon the vitality of German pharmacy has also had reflex influence upon the prosperity of the professional and scientific interests and productions. The proverbial love for active scientific progression seems to be less than formerly a common inspiration in the profession of pharmacy. The intense struggle to acquire property and to maintain it when acquired, or the floating of a large mortgaged indebtedness requires more mercantile business energy, while it represses the inclination and striving for the more ideal things, and chills the once much famed scientific spirit of the German apothecary to the freezing point, and creates and fosters a class of tiros. The German apothecaries' profession lives commercially very largely from hand to mouth, and professionally it subsists on the fame of a more spirited and productive past."

The salability of former privileges and concessions for the pursuit of pharmacy had created artificial specific values and monopolies, which finally developed into illusory purchases and brought about a trading among apothecaries against which evil the state, the Reichstag and socialism are at present powerless. On the other hand the opulence of the pharmacies, the number of which was formerly limited to be in a certain ratio with the population, has been greatly reduced by the trade in simple drugs and articles used for medical and technical purposes being made free, for since then there have grown up beside the pharmacies numerous drug stores, and their number in course of years has grown so that at the present time there are on an average about three retail drug stores for every pharmacy.

Another incubus, and one that has brought to American pharmacy an almost incurable malady, one that has harmed it more than anything else, has also crept into German Medicine and Pharmacy—the secret remedy nuisance. This ancient and inexterminable misuse of medicine, which is rooted in the avarice, superstition and credulity of human nature and which has seldom abated only to arise again in other form and more modern garb, has brought into the German pharmacy the same seed of corruption and decadence which has brought to American pharmacy so much evil and caused such a decline. But neither there nor here is pharmacy to be held entirely responsible for this traditional and most remarkable debasement of the science of medicine. The existence of "popular remedies" ("Volksmedicin"[1]) in all their varied forms, characters and deceptions, may be observed to follow mysticism like a dark shadow from antiquity throughout the history of civilization. Though the illusions and the dogmas of the age of the adepts and iatro-chemists have fared as have all the errors and failings of mankind and been dispelled, and though the store of medicines has been relieved of so much ballast of curious and nauseating remedies, whereby the science of healing and of materia medica is thought to have been thoroughly purified and reformed, yet, notwithstanding all this, the ancient superstition and the stereotyped wonder-faith in all possible medicines, healing methods and practitioners continues, and with undiminished confidence, as though it were instinctive. In spite of the much talked of high standard of medical knowledge and skepticism, and in spite of a real and supposed enlightenment, various old patent remedies have remained or have been introduced as salable articles in the German pharmacy beside the modern specialty bearing a scientific name; and this is not infrequently brought about by physicians or through their agency, as has been long a wellknown fact in foreign countries where it has done much harm to pharmacy.

Yet this is only one of the many elements, and probably a subordinate one, which tends to bring the present movement for reform in the situation of German pharmacies to a definite conclusion. This reform is in the direction of putting an end to a speculation in the illusory values of apothecary's privileges and concessions, which has been going on for a long time. The chronic sentimentality of the factors coming into consideration in this movement, pressed by the force of facts and reality, seems to have come within reach of the "*lex talionis*", and therefore there seems to be a prospect that this child of travail of German pharmacy will be disposed of *brevi manu* on an economical and financial basis. The former and present propositions for reform in this direction are of little interest to foreign countries and have no practical value for them. The evils which endanger the welfare of pharmacy or tend to bring about its gradual decadence, are probably the same everywhere, but in Germany the state enters as a controlling factor into the commercial management and the existence of the pharmacies, while in the United States their welfare is solely dependent upon the ability, enterprise and inclination of the individual, and subject to the natural laws governing all enterprises.

It would be interesting, however, to acquire an understanding how well or how poorly the German apothecaries' profession is prepared to meet the alternative of an industrial reform which is evidently close at hand. A paper recently published by a physician in the service of the Prussian government gives some very detailed and certainly very startling information on this subject. It is the pamphlet "Zur Entwickelungsgeschichte der Apothekenreform",[2] a thoroughly objective treatise evidencing comprehensive knowledge of the subject; it describes the present situation and condition of pharmacies, and among other things presents a clear view of the dangers and symptoms of a decadence which seems to exist in the various classes of pharmacists, the proprietors, the clerks or those verging into other branches of trade or profession. The article further demonstrates to every foreigner familiar with the matter, how thoroughly German pharmacy and her sister industry, the retail drug trade, have become Americanized and how they stand on shaky ground and suffer from ills similar to those of the American prototype. This may be deduced, and not without profit and warning for American pharmacy, from the following fragmentary extracts from the pamphlet mentioned:

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[1] This journal, 9, p. 151.

"Since the separation of chemistry from pharmacy and the centralization of the production of medicinal preparations in the hands of the pharmaceutic-chemical manufactories, the labors of the pharmacist have been transformed from industrial to mercantile. The professional apothecary of the past has been succeeded by the trader. Even the prescription work has been restricted and has deteriorated in scientific value, since the wholesale industry succeeded in preparing medicaments all ready to be dispensed and capable of preservation for almost any length of time. The dispensing apothecary has thus been largely converted into an automaton and the German pharmacy has become incapacitated for the training of apprentices."

"In order to restore to the profession the scientific character of former years, which it is now losing more and more, the apothecaries have made the educational problem the order of the day and graduation from the gymnasium has been required. In a time, however, when the profession steadily acquired a more technical and commercial aspect, and its practice grew less scientific and constantly simpler, and the German pharmacy less able to educate the apprentices, such a requirement seemed all the more unreasonable, inasmuch as the social relation of equality with the other learned professions does not depend upon graduation from the gymnasium, and university study, but upon the character of later professional work. It would, however, prevent the overcrowding of the profession, but on the other hand create a very presumptious proletariate and develop a class of workers ill adapted to manual work. They went even further. The apothecaries strove to get control of a field in hygiene which was receiving more and more attention. The pharmacy was to become a hygienic institute in which such diagnoses of the physician and sanitary officer as rested upon chemical and bacteriological investigation should be made, the apothecary thus becoming the "adviser of the physician". The science of forensic and food chemistry was to bring back life into the quiet laboratory of the apothecary, and to be an incentive to love of profession and raise the estimation of the apothecary in the eyes of the public. They were the old dreams that the apothecaries cannot help indulging in."[3]

"The apothecaries did nothing more to divert the evils which beset them in their own camp. Since the death of Dr. Brunnengraeber[4] who for many years had been the efficient president of the German apothecaries' association, the tactics of these associations have been different. Formerly they fought with arguments and had positive propositions to make, now only speeches are made. Formerly one who differed in his views, might learn with pleasure from the practical dissertations of the apothecaries' associations; now many a like-minded person is disgusted with the wild noise, and the particular mode of agitation, carried on with a special agitation fund, the lobbies, the boasting, the influencing of the press and legislators, the practice of creating personal suspicion, the disrespect of the person of the opponent, and last, not least, the hierarchical inclinations of the executive board of the associations."

"The salability of concessions to apothecaries, conflicting with the trades law of the empire and antagonizing the feeling of justice among the people, has led to the creation of fictitious values and to the encumbrance of apothecaries with debt, it has made it impossible for the poorer pharmacists to become independent and has reduced apothecaries, that were once well to do, to mere vassals of their creditors. A mercantile spirit was introduced into the pharmacies and changes in ownership became too frequent for orderly management, while the secret remedy swindle, quack humbug, apprentice nuisance, and uncertainty in business were the things complained of."

If Dr. Springfeld means to put the responsibility for the introduction of secret remedies and specialties into the apothecary shop upon the pharmacists alone, it has already been said in reply that the continuation of this phase or decadence of the affairs of medicine is beyond the control of medical science or of pharmacy and even of the state. So long as the practice of medicine has a halo of the mysterious about it and while the healing art remains in a state of empirical or scientific experimentation, superstition and faith in the miraculous efforts of real and imaginary remedies and healing methods will hardly be dispelled.

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[2] Pamphlet. 83 pages. Publisher Georg Thieme in Leipzig. Price 35 cents. 1896.

[3] This alternative, desired and striven for until now by the best men in the profession here and abroad cannot be hoped to be realized for the apothecary, considering the activity in medical circles and the rapidly advancing development in bacteriology, which is so closely affiliated and enters so deeply into the biological and physiological sciences. The substance and all the relations of bacteriology to the healing art and hygiene are so overwhelmingly within the province of medical study and effort, that the apothecary can or will hardly be called upon to participate in it in the near future. Whoever has a desire or feels called to pursue the branch, should at once choose the study of the respective medical preparatory sciences, or go over to them. The way to the bacteriological and hygienic pursuits will not much longer lead through the pharmacy.

[4] See this journal, 11, p. 96.

Yet Dr. Springfeld points out very justly the inconsistency of apothecaries in regard to the trading in secret medicines.

"Formerly the apothecaries made war upon secret remedies, as being an intrusion into their domain. When in 1887 it was announced that the advertisement of secret remedies was forbidden, the apothecaries were the ones who made it difficult to enforce these ordinances and raised the cry that secret remedies belong to the pharmacy. The manufacturers of the secret remedies, driven by the police, found a retreat for their products in the pharmacies. The more severe the measures taken by the government to suppress the secret remedy nuisance, the more the apothecaries considered the trade in such remedies their monopoly. They found that by uniting production and sale of the article a considerably larger profit was secured and so they became inventors of all sorts of remedies. This brought on the metamorphosis from a dealer in secret remedies to a healing quack."

"Since the production of medicinal preparations in the pharmacies has ceased and the apothecaries now depend upon the wholesale pharmaceutical-chemical industry, they are unable to satisfactorily guarantee a large number of their wares, and for the remedies that are dosed and ready to be dispensed, and such as are prepared with the aid of bacteriological methods, they are unable to assume any guarantee at all, and therefore stand no higher in this respect than the druggists, who draw their supply from the same source." .... "The German pharmacy is incapable of educating apprentices, and the exacting scientific requirements of the apothecary's examination and the practical manual work which the examined assistant is to do, are entirely out of proportion with each other. It has created a pretentious and dissatisfied class of assistants."

"The greater part of the German pharmacies lack an equitable foundation. The rights and values they possess are uncertain and tremble before every project for reform. The stability of the undertaking must suffer from this in the long run."

This and other evils are now to be overcome by a law which was prepared in the "Kultusministerium." A commission which was consulted in the framing of the law consisted of 9 jurists, 4 physicians, 9 owners of pharmacies and 6 pharmaceutical assistants. A synopsis of this draft for the projected regulation by law of the affairs of German pharmacies has been printed, together with the suggestions of the commission and the reasons for them, as an appendix to the above mentioned pamphlet. It has no special practical value and is of little interest to the pharmacist in foreign countries. In the interest of German pharmacy however and for its honor it is more than desirable, that after so many vain efforts during a number of decades, this stale problem be at least deposed of by a solution as gentle as possible yet peremptory.

Fr. H.

ORIGINAL CONTRIBUTIONS.

The Testing of Strontium Bromide.

By *Carl E. Smith.*

Although the descriptions of the strontium salts and the tests for impurities in them, as given by the Pharmacopœia, will reject any dangerously impure article, it is quite possible that a salt, while fulfilling all requirements of this authority, may still be far from pure. Not only is this true of the bromide, which alone is to be discussed here, but as well of the other two salts admitted into the Pharmacopœia at the last revision.

The test for barium does not show the presence of much smaller quantities than 0.5 p. c. of this substance; a test for calcium, which is a very common impurity, is entirely absent; and the method for estimating the chloride present is apt to give misleading results, as it stands now.

Detection of Barium.—A number of control-tests, to be described, were made with a salt known to be practically free from barium and calcium from the manner of its preparation, nor could any barium be found by testing a cold saturated solution with potassium bichromate, but as the spectrum test was not applied, entire absence was not proven. However the possible presence of minute traces would not appreciably influence the results. In each of the following trials 5 drops of potassium bichromate solution were added to about 10 cc. of the solution to be tested.

Percent $BaCl_2.2H_2O$ in $SrBr_2.6H_2O$.	Percent strength of solution.	Results.
1.	5	Turbid at once.
0.75	5	Cloudy in ½ minute.
0.5	5	Very faint cloudiness after 5 minutes.
0.5	10	Faint cloudiness in 1 minute.
0.25	5	Perfectly clear after 1 hour.
0.25	10	Very faint cloudiness after ½ hour.
0.1	25	Cloudy within 1 minute.
0.05	25	Clear after ½ hour.

Barium chloride in distilled water alone, diluted so as to represent a 5 p. c. solution of a salt containing 0.1 p. c. of barium chloride (1 in 20,000), showed a reaction within 2 minutes.

A solution of twice the above strength became turbid at once; very turbid after standing a short time.

These results make it appear that this test, while fairly delicate when applied to a barium salt dissolved simply in water, is considerably less so, when barium is tested for in strontium bromide. There seems to be no better test available, however, and this will answer all practical purposes, when applied to a rather more concentrated solution than the Pharmacopœia directs. Worded something like the following, it would show the presence of about 0.1 p. c. of barium salt:

If 2 gm. of the salt be dissolved in 6 cc. of water, the solution acidulated with a drop of diluted acetic acid, and then 5 drops of potassium bichromate test solution added, the solution should remain clear for at least 1 minute.

As the salt is liable to contain traces of strontia, which would have the effect of causing a precipitate of strontium chromate in the concentrated solution on the addition of bichromate solution, the addition of a little acetic acid is recommended in this test.

Detection of Calcium.—The absence of a test for this impurity in the U. S. P. would seem to indicate that the Committee of Revision had overlooked the probability of its being present, and very likely its experiments were inadvertently made with specimens thus contaminated. This would explain the characterization of "very deliquescent", for strontium bromide, when pure, is not nearly so deliquescent as is usually supposed. When free from calcium, it does not deliquesce in moderately dry air and even after prolonged exposure to a very humid atmosphere it does not absorb enough water to cause it to liquify. But the presence of only a small amount of calcium is enough to make it so hygroscopic, that it is very difficult to dry the crystals even over sulphuric acid. Thus, the degree of deliquescence may serve as a rough measure of the amount of this impurity.

It is not so imperative to exclude calcium from a medicinal salt as is the case with barium, but it appears that a limit should be set. A salt may contain a large proportion of it and still be in accord with the descriptions and definitions of the present Pharmacopœia. And it is very likely to be present.

A test based on H. Rose's method for the quantitative separation of calcium from strontium is perhaps the most readily applied and is sufficiently accurate, although it does not detect minute quantities. It is as follows:

Heat on a water-bath for 5 minutes a mixture of 1 gm. of the salt to be tested, 3 gm. of ammonium sulphate, 10 cc. of water, and a few drops of ammonia water. Then filter and to the clear filtrate add 5 drops of ammonium oxalate test solution. If the solution becomes turbid at once, 1 p. c. or more of calcium salt is present; if only after 5 or 10 minutes, about 0.5 p. c. is present.

Estimation of Chloride. — To obtain correct results by the indirect method prescribed, it is, of course, necessary that the salt be free from water, and the Pharmacopœia directs it to be "rendered anhydrous by thorough drying." But it is not stated how the drying is to be done, and it is not likely to be accomplished without definite directions, as will be shown subsequently.

When pure strontium bromide is heated in a water-oven (about 95° C.) on a watch-glass, it does not melt, but gradually effloresces and loses 5 molecules of water in about 2 hours. The remaining molecule is not driven off entirely in any reasonable length of time even at 150°. A temperature of about 250° was found quite sufficient, and no doubt is higher than necessary, but when kept at this point very long, there is some loss of bromine and the salt acquires an alkaline reaction. A rather convenient and rapid way to dry it is to heat it carefully in a porcelain crucible just short of the fusing point of the anhydrous salt. If the heating is not prolonged unnecessarily, there will be only an insignificant decomposition. This method of drying is not to be recommended except in cases where haste is necessary.

It will not always occur to the analyst that such an unusually high temperature is necessary to drive off all water of crystallization, and therefore more detailed directions in the Pharmacopœia as to the drying would be a decided advantage, especially, as the presence of only a small amount of water will cause a large error in the estimation.

A convenient formula for calculating the results of titrations may be mentioned here.

$$\frac{(n-81.03\ w)\ 100}{(126.54\ w-n)+(n-81.03\ w)}=\chi$$

w = Weight (in gm. or fraction of gm.) of anhydrous salt taken for analysis.
n = Number of cc. of $\frac{N}{10}$ silver nitrate required to precipitate the above.
81.03 = Number of cc. of $\frac{N}{10}$ silver nitrate required to precipitate 1 gm. of pure strontium bromide.
126.54 = Number of cc. of $\frac{N}{10}$ silver nitrate required to precipitate 1 gm. of pure strontium chloride.
χ = P. c. of strontium chloride in the salt tested.

It will be seen that this formula can be readily changed so as to make it applicable to all similar operations of indirect analysis.

Laboratory of E. R. Squibb & Sons,
Brooklyn, N. Y., October 1896.

On the Occurrence of Sulphur Derivatives in American Peppermint Oil.

By Dr. *Clemens Kleber.*

In an investigation of American peppermint oil conducted jointly with Dr. F. B. Power[*] it was shown that this oil is one of the most complicated known. As many as fifteen different constituents were identified and characterized. Observations made since have demonstrated that still other substances are contained in this oil.

During the process of rectification of crude peppermint oil it was observed regularly that in the beginning of the distillation a peculiar disagreeable odor escaped and rapidly filled the room in which the operation was conducted. This odor was perceived only with the very first fraction of the distillate and was evidently due to a very volatile compound. Upon the necessary modification of the process it became possible to collect a considerable quantity of this volatile compound. A preliminary test revealed the surprising fact that the compound in question was a sulphur derivative. A piece of filter paper, saturated with a few drops, was burnt under a large inverted beaker, the inner wall of which had been moistened with water. After several minutes the vapors deposited on the beaker were washed together, the solution oxidized with a few drops of permanganate solution and clarified by boiling with a little hydrochloric acid. Upon the addition of barium chloride test solution a copious precipitate of barium sulphate was produced.

On account of the great volatility of the substance it seemed natural to suspect carbon disulphide. However, the following tests gave negative results: the substance was set aside with alcoholic ammonia, subsequently evaporated and the residue tested with a ferric salt for sulphocyanate; upon

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[* This journal, vol. 12, p. 157.]

heating with alcoholic potassa the characteristic copper salt of xanthogenic acid was not obtainable; the liquid did not react with phenylhydrazine.

It became necessary, therefore, to purify the substance in question. This was readily accomplished with the aid of a fractionation tube. After these fractionations a substance with a constant boiling point of 37 to 38° was obtained. It is a mobile liquid, lighter than water and insoluble in the same. Its odor is ethereal, but disagreeable, especially when diluted. With an alcoholic solution of lead acetate it produced no precipitate, neither could a compound with mercuric oxide be obtained. The compound in question evidently was not a mercaptan. On the other hand it produced immediately a white crystalline precipitate with an alcoholic solution of mercuric chloride. An alcoholic solution of the sulphur compound was therefore precipitated with an alcoholic solution of mercuric chloride. The precipitate was washed with alcohol, dried over sulphuric acid, suspended in water, the mixture acidulated with nitric acid and silver nitrate added.

0.9520 gram substance yielded 0.8019 AgCl and 0.0081 Ag, corresponding to 21.11 p. c. Cl. This percentage corresponds to the chlorine content of the mercuric chloride compound of dimethyl sulphide $(CH_3)_2S.HgCl_2$, which requires 21.32 p. c. chlorine. The boiling-point of the original substance also corresponds with that of dimethyl sulphide. With platino hydrochloric acid a yellow crystalline precipitate was obtained, the platinum percentage of which, however, was repeatedly found a little too high for a compound of the formula $[(CH_3)_2S]_2PtCl_4$. Inasmuch as the compound gave off the odor of dimethyl sulphide while drying, this deficiency can readily be accounted for by the partial decomposition of the precipitate.

For further characterization the oxidation-products with nitric acid were prepared. If the sulphide is allowed to drop into the nitric acid, a part is lost owing to the volatility of the substance and the violence of the reaction. The sulphide is therefore allowed to flow under a layer of concentrated nitric acid kept cold with ice by means of a separating funnel. At the close of the very violent oxydation the mixture is boiled in the open flask until no more red vapors are evolved. If now a part of the solution is concentrated on a water-bath, the residue solidifies to a radiating crystalline mass, which readily deliquesces, and melts again on the water-bath. It evidently consists of the nitrate of dimethyl sulphoxide, first prepared by Saytzeff.[†] In order to convert this compound into the corresponding sulphuric acid, Saytzeff heated it with fuming nitric acid in sealed tubes. It is, however, more convenient to convert the former into the latter by heating its nitric acid solution. If the evaporation of the solution is continued, nitric acid first distills off, but when a temperature of about 150° is reached a quiet evolution of nitric oxide takes place. Heat is applied until the yellow color in the neck of the flask has disappeared. Upon cooling, the residue crystallizes, forming the handsome crystals of dimethyl sulphone, which when recrystallized but once from hot alcohol are pure and melt at 108°. On account of the great stability of the sulphuric acid not a trace of sulphuric acid is found in the course of the oxidation.

Dimethyl sulphuric acid has a great capacity for crystallization and crystallizes from the hot saturated solutions of a great variety of solvents in long, flexible, striated needles.

From the above it follows that methyl sulphide must be added to the already known constituents of peppermint oil. It has also been ascertained that it is a regularly occurring constituent of American peppermint oil. If from about 50 cc. of oil a few drops are distilled with sufficient condensation, the distillate need but be shaken with an aqueous solution of mercuric chloride in order to obtain the white precipitate described above.

Furthermore, dimethyl sulphide does not appear to be the only sulphur compound contained in peppermint oil. In the course of the rectification of crude oil, after a certain portion of the oil has distilled over, a penetrating, disagreeable odor becomes noticeable, which resembles that produced when organic sulphur compounds are decomposed by heat. A study of these phenomena will be undertaken.

Garfield, N. J., Scientific Laboratory
of Fritzsche Brothers.

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Palatable Cascara Preparations.

By *Leo C. Urban.*

In most of the published formulæ for making bitterless cascara preparations, calcined magnesia is employed.

Recently Gilpin, Amer. Journ. Pharm., Vol. LXVIII, p. 135, gives a process for the preparation of a bitterless cascara in which the same agent is used. The National Formulary process for making aromatic fluid extract of cascara likewise employs calcined magnesia for the removal of the bitter principle.

The same results are obtained by the use of freshly slaked lime at a proportionally lower cost.

The following formula for Aromatic Fluid Extract of Cascara will serve as an illustration of the method of procedure:

Cascara sagrada...........	1000	grams
Licorice root................	150	"
Freshly slaked lime.......	100	"

The lime is thoroughly mixed with the ground drugs and the mixture kneaded with 1000 cc. of water. This is allowed to macerate for ten or twelve hours and then dried at a temperature of between 40° C. and 50° C. It is then moistened with 400 cc. of a menstruum composed of

500 cc. alcohol,
250 cc. glycerin,
250 cc. water.

It is then firmly packed in a percolator and the balance of the menstruum poured upon it followed by water sufficient to exhaust the drug. The first 850 cc. of the percolate are reserved; the weaker percolate is evaporated to a syrupy consistence and added to the first percolate. The aromatics, say 12 cc. of compound spirit of orange, are added, and lastly sufficient dilute alcohol to make 1000 cc.

The resulting preparation is very palatable and possesses the cathartic properties of cascara in a marked degree.

Laboratory of the Kremers & Urban Co.,
Milwaukee, Wis.

[† Ann. Chem. Pharm., 144, p. 148.]

TRANSLATIONS.

Reagents and Reactions known by the Names of their Authors.*

Based on the original collection by *A. Schneider*, revised and enlarged by Dr. *Julius Altschul.*

Jolles' test for mercury in the urine. 100 ccs. of urine are warmed with 2 g. of granulated gold, with the addition of some stannous chloride. After decanting the liquid, any amalgam that may be formed is washed with water and then introduced into a test tube with a little water and an equal volume of freshly prepared stannous chloride solution. The slightest traces of mercury cause a distinct turbidity. The mercury can be quantitatively estimated by heating the dried amalgam. Compare *Merget's* test.

Jorissen's reagent for alkaloids is a solution of 1 g. zinc chloride in 30 g. each of hydrochloric acid and water. When evaporated to dryness with this solution, alkaloids give characteristic color-reactions. For particulars see *Hager*, Pharm. Praxis III, 1250.

Jorissen's fusel oil reaction. Upon shaking whisky with ether, evaporating the ethereal layer, and treating the residue with colorless aniline and hydrochloric acid, a beautiful red color is produced if fusel oil was present. The reaction is not produced by fusel oil contained in the alcohol, but is due to the presence of furfurol, another of the fermentation by-products (*Förster*). If considerable quantities of furfurol are present, the liquid may be tested directly with a few drops of aniline and hydrochloric acid.

Jorissen's morphine reaction. Morphine is heated on a water-bath with a few drops of concentrated sulphuric acid and a crystal of ferrous sulphate, and the resulting liquid poured into a few ccs. of ammonia water. At the zone of contact a red color develops, rapidly changing into violet, while the ammonia solution turns blue.

Ittner's hydrocyanic acid reaction. An alkaline cyanide solution when mixed with a solution of a ferrous-ferric salt, yields a precipitate of Prussian blue.

Jungmann's reaction for alkaloids. Upon treating the precipitates obtained with phosphomolybdic acid (comp. *Sonnenschein's* reagent) with ammonia, some are colored blue or green. (*Hager*, Pharm. Praxis I, 203.)

Karle's reaction (see *Wiederholt*).

Kassner's reaction for hydrogen peroxide. Upon the addition of potassium ferricyanide and caustic potash solutions, oxygen is evolved.

Kayser's saccharin test. The substance to be tested is shaken with a mixture of ether and petroleum ether, and the residue left upon evaporation of the ethereal layer tested for sweetness.

Keller's test for the principles of digitalis. The substance to be tested is dissolved in 3—4 ccs. of glacial acetic acid, a drop of dilute ferric chloride solution is added, and the solution poured in a layer upon concentrated sulphuric acid:

Digitonin yields a rose-red zone, which rapidly fades.

Digitalin yields a permanent, carmine-red zone.

Digitalein yields a red zone, fading somewhat rapidly.

Digitoxin yields at first a dirty brownish-green zone, after which the upper portion of the sulphuric acid is colored brownish-red, above which a blueish-green band is formed.

Kerner's test for quinine in urine depends upon the fluorescence of quinine solutions. Since the fluorescence is prevented by sodium chloride, a concentrated solution of mercurous chloride is added to the urine as long as a precipitate is produced. Upon filtration, the presence of appreciable quantities of quinine becomes apparent, more easily by the use of a fluoroscope.

Kerner's test for the purity of quinine salts. Quinine sulphate is much less soluble in water than are the sulphates of the allied alkaloids. If therefore quinine sulphate (or any other quinine salt after the addition of sodium sulphate) is shaken with a definite amount of water, the quantity of ammonia required to produce a permanent precipitate in the filtrate will be a measure of the percentage of allied alkaloids present. Upon digesting 2 g. of pure quinine sulphate in 20 ccs. water at 60°—65° C. for half an hour, then allowing this mixture to stand for 2 hours at 15° C. with occasional shaking, and subsequently filtering through glass wool, 5 ccs. of the filtrate require 4—4.3 ccs. of a 10 p. c. sol. of ammonia. In the presence of cinchonine, quinidine etc., more ammonia will be necessary.

Kieffer's reaction for morphine. Upon the addition of 5—6 drops of ferric chloride solution (1:8) and 3 drops of a sol. of potassium ferricyanide (1:100), a drop of morphine solution will cause a blue coloration or a blue precipitate in consequence of the reduction of the ferricyanide.

Kieffer's reagent for free mineral acids. A solution of copper sulphate is carefully treated with ammonia water until the resulting precipitate is just redissolved. Solutions of neutral metallic salts which show an acid reaction toward litmus, produce a turbidity with this reagent; if, however, the salts contain free mineral acids, the mixture remains clear.

Kintschgen-Gintl's reagent. See *Millon's* reagent.

Klein's solution for the mechanical separation of the constituents of a powdered mineral, is an aqueous solution of cadmium boro-tungstate, sp. gr. 3.3. See *Thoulet's* solution.

Klunge's reaction for aloes (Cupraloin reaction). A very dilute solution of aloes is colored yellow by the addition of copper sulphate. If sodium chloride is added and the mixture gently warmed, a red color results. Upon adding alcohol in addition to sodium chloride, this color is produced at ordinary temperatures.

Knapp's solution for the determination of glucose is a solution of 10 g. mercuric cyanide and 100 ccs. soda lye (sp. gr. 1.45) in enough water to make a liter. This solution is reduced upon warming with glucose, metallic mercury separating out. Kreatin and kreatinin act similarly. 40 ccs. of the solution correspond to 0.1 g. glucose.

Knop's reagent for the estimation of nitrogen in ammonium salts and in amides by means of the azotometer is sodium hypobromite. See *Hüfner.*

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* Continued from p. 256.

Koch's methyl-violet solution for staining bacteria is made by adding a few drops of a concentrated solution of methyl-violet in absolute alcohol, to 20 ccs. distilled water, whereby an intensely yellow colored solution results.

Koch's tuberculosis stain. 2 ccs. anilin are shaken with 20 ccs. water and the mixture filtered through a wetted filter. To the clear filtrate, alcoholic fuchsin (or gentian-violet) solution is added until a film of metallic lustre indicates saturation.

Koch's cholera reaction. The addition of sulphuric acid to cholera cultures (on peptone) causes a red coloration, due to the action of the sulphuric acid on the two decomposition products of the cholera bacillus: indol and nitrous acid.

Koehler's alkaloid reaction. See *Langley's* reaction.

Koettsdorfer's number indicates the amount of caustic potash, in milligrams, required to completely saponify one gram of a fat.

Kolter's reaction for hypochlorous acid. Shake the liquid to be tested with metallic mercury, whereby, in the presence of this acid, brown oxychloride of mercury is produced.

Kraemer's test for acetone. See *Messinger's* test.

Krehbiel's reaction for coloring matter of the bile. Treat the urine to be tested with one fourth its volume of hydrochloric acid and add chlorinated lime solution drop by drop. In the presence of biliary coloring mater a green color is produced. Bromine water gives the same reaction, called also the *Trousseau-Dumonpallier's* reaction.

Krueger's glucose reagent. See *Boettger's* test.

Labich's reaction for cottonseed oil. Mix 25 ccs. of the melted suspected fat with 25 ccs. of a solution of 500 g. lead acetate in 1 liter water, previously warmed to 35° C., and with 5 ccs. ammonia water (22° Baumé), and stir this mixture for several minutes until a homogeneous emulsion results. In the presence of cottonseed oil, the emulsion is colored orange-red. *Deiss* modified this test to prove the presence of cottonseed oil in olive oil, by dissolving 10 ccs. of the oil in 100 ccs. of ether, shaking the solution with 5 ccs. of a concentrated lead acetate solution and again shaking after the addition of 5 ccs. ammonia water.

Ladendorf's reaction for blood. Treat the solution to be tested with tincture of guaiac wood and then with oil of eucalyptus. In the presence of blood the lower layer is colored blue, the upper one of oil of eucalyptus, violet.

Lafon's reaction for digitalin. This substance yields a blueish-green coloration with a solution of 1 g. of sodium selenate in 20 g. concentrated sulphuric acid. (*Lafon's* reagent.) In place of sodium selenate, the corresponding tellurate may also be employed.

Lamal's morphine reaction. 2—10 drops of morphine solution are evaporated on the water-bath with a like quantity of uranium acetate solution (0.015 g. uranium acetate and 0.01 g. sodium acetate in 5 ccs. water). Permanent light red or hyacinth-red rings remain behind. Oxymorphine gives the same reaction, but toxine and most alkaloids do not.

Landolt's phenol reaction. Upon adding supersaturated bromine water to a solution of phenol, a white, crystalline precipitate of tribromphenol is formed. Similar precipitates result with cresol, oxybenzoic acids, indol, indican, cyanures and other compounds, a fact that must be borne in mind in the examination of urine for phenol.

Langley's reaction for alkaloids. Upon mixing with nitric-sulphuric acid and subsequently supersaturating with soda lye, various alkaloidal salts show characteristic colorations. For details see *Dragendorff*, Ermittelung der Gifte, p. 283.

Langley-Koehler's alkaloid reaction is a modification of the preceeding, whereby the alkaloids are mixed with 3—5 times their weight of potassium nitrate, then 1—2 drops of sulphuric acid are added, followed at once by an excess of concentrated soda solution.

Lassaigne's hydrocyanic acid reaction. Upon adding to a solution containing hydrocyanic acid a few drops of caustic potash solution followed at once by a few drops of copper sulphate solution and slightly acidulating with hydrochloric acid, a white precipitate of cuprous cyanide is formed. A solution of copper sulphate in sulphurous acid can also be employed as a reagent to produce the same precipitate in solutions containing hydrocyanic acid.

Lassaigne's test for organic nitrogenous compounds. Heat about 0.01 g. of the substance to be tested with a small piece of sodium in a test tube, add 2—3 ccs. of water, then some ferrous-ferric salt solution, and acidulate with hydrochloric acid. If any nitrogenous body was present, a precipitate of Prussian blue is formed.

Laubenheimer's reaction for thiotolene. This substance yields a blueish-green color with a solution of anthraquinone in glacial acetic acid. The coloring matter is precipitated by water, but is redissolved by ether to form a violet solution.

Lechini's test for the presence of blood in urea. 10 ccs. of urine are treated with a drop of glacial acetic acid and shaken with 3 ccs. of chloroform. In the presence of coloring matter from the blood, the chloroform will form a red layer at the bottom.

Legal's test for acetone (in the urine). Several ccs. of the distillate from urine are treated with a few drops of a freshly prepared solution of sodium nitroferricyanide and a few drops of soda (or potassa) lye. A red color is produced; after this has faded, an excess of acetic acid is added. In the presence of acetone, a purple color is produced. Creatinine also shows a fading of the first-formed red color; however, upon the addition of acetic acid, first a green, then a blue color is produced. Compare *Le Noble.*

Léger's reagent for bismuth is a solution of cinchonine nitrate with potassium iodide, in which solutions of bismuth salts produce a dark-red precipitate.

Lehmann's test for glucose. Dissolve the substance in alcohol, add alcoholic potash, then copper sulphate solution, and warm. In the presence of glucose, separation of red cuprous oxide results.

Le Noble's reaction for acetone in the urine. Upon adding sodium nitroprussiate and ammonia to urine containing acetone, a violet color gradually forms. Compare *Légal's* test.

Leismer's test for sugar in the urine. 5 ccs. of a 0.1 p. c. solution of safranine, 1 cc. urine, and 2 ccs. soda lye are heated to boiling. In the presence of grape sugar, the solution is decolorized.

Lenz's reaction for pilocarpine. Upon rubbing up the alkaloid or its chloride with 100 parts of calomel, a gray to black color is produced, due to the reduction of the calomel. According to *Nagelvoort*, in the case of pilocarpine nitrate, the free base must first be separated with ammonia, and extracted with chloroform, after which the residue left upon evaporation of the $CHCl_3$ is treated as above.

Lepage's reagent for alkaloids. See *Marmé's* reagent.

Letheby's aniline reaction. Aniline yields a blue color upon heating to 50° C. with MnO_2 and dilute sulphuric acid.

Lewin's test for biliary coloring matter. The urates separating out upon strongly cooling urine are filtered out, washed, dissolved in hot water and this solution tested for coloring matter from the bile. See *Gmelin*.

Lewin's modification of *Baudouin's* test. See *Baudouin*.

Lex's phenol reaction. Upon adding to an ammoniacal phenol solution a solution of a hypochlorite (chlorinated lime sol. 1:20), or of bromine water (Cotton's modification), a green color is produced, changing to blue upon warming.

Lieben's acetone test. Add to the solution to be tested (e. g., to the distillate from urine) a solution of iodine in potassium iodide and a few drops of caustic potash solution, whereby in the presence of acetone iodoform is formed. Alcohol gives the same reaction. See *Gunning's* test.

Liebermann's reaction for cholesterin. According to *Burchard*, a solution of cholesterin compounds in acetic acid anhydride, with the addition of chloroform, is colored rose-red by concentrated sulphuric acid. The color rapidly changes to blue and green.

Liebermann's phenol reaction. Upon warming phenol with sulphuric acid in which 5% sodium nitrate has been dissolved, a blue color is produced. The addition of water causes a brown precipitate.

Liebermann's reaction for diazo and nitroso compounds. These become intensely colored upon the addition of a mixture of phenol and sulphuric acid.

Liebig's hydrocyanic acid test. Upon evaporating hydrocyanic acid with ammonium sulphide after the addition of a few drops of caustic potash solution, dissolving the residue in water, this solution after acidulating slightly with hydrochloric acid, becomes blood-red when treated with a little ferric chloride solution.

Liebig's quinine test. Upon shaking 0.5 g. of quinine sulphate in a stoppered test tube with 5 ccs. of ether (sp. gr. 0.728) and 1 cc. ammonia, two clear layers should form after standing. A turbidity indicates cinchonine or allied alkaloids. Compare the more delicate tests of *Kerner*, *Schaefer* and *De Vry*.

Liebig's test for cystine. The cystine prepared from the sediment of urine yields a black precipitate of PbS upon boiling with a solution of lead oxide in soda lye.

Lifschuetz's mixture for dissolving cellulose consists of sulphuric and nitric acids.

Linde's test for glycerine (separated from fluid-extracts).

1. The solution is rendered slightly alkaline with dilute solutions of sodium carbonate, and then mixed with powdered borax upon a watch crystal. If glycerin is present, a small quantity of the mixture introduced into an alcohol or gas flame upon a platinum wire will color the flame green.

2. Red litmus paper is saturated with a concentrated borax solution and thereby turned to blue. Upon moistening this paper with the glycerine solution previously rendered slightly alkaline, the red color reappears more or less rapidly, depending upon the concentration of the glycerine solution.

Compare *Hager's* glycerine reaction.

Lindo's reaction for alkaloids. The alkaloid is dissolved in dilute sulphuric acid, after which some ferric chloride is added. Concerning the resulting color reactions, see *Hager*, Pharm. Praxis III, 64.

Lindo's reaction for nitrates and nitrites. 0.5 ccs. of a solution of a nitrate or nitrite gives a purple color upon the addition of a drop of HCl (15 p. c.), a drop of resorcin solution (10 p. c.), and 2 ccs. of pure concentrated sulphuric acid.

Lindo's reaction for saccharin. Upon evaporating saccharin to dryness with concentrated nitric acid, treating the residue with a few drops of a solution of potassium hydroxide in 50 p. c. alcohol and warming, blue, violet, purple, and red colors will appear in succession.

Lipp's reaction for dextrin. A cold saturated solution of lead acetate is heated to 60° C. and enough lead oxide is added to solidify the mass. After some time the mass is extracted with water and the solution filtered. This solution causes a white precipitate when boiled with a solution of dextrin.

Loeffler's stain (alkaline methylene blue) for identifying tuberculosis bacilli consists of a mixture of 30 volumes of a concentrated alcoholic methylene blue solution with 100 volumes of potassa solution (1:10,000).

Livache's test for fatty oils consists in observing the increase in weight of oils when mixed with finely divided lead.

Loewe's solution for identifying glucose. Mix a solution of 16 g. copper sulphate in 64 g. water with 80 ccs. of soda lye (sp. gr. 1.34) and 6—8 g. glycerine. With solutions of glucose or with diabetic urine this reagent causes a red precipitate upon warming. For quantitative estimation the reagent is prepared as follows: 15.621 g. of cupric hydroxide (prepared from 40 g. of crystallized copper sulphate) is warmed while still moist, with 30 g. glycerine, 80 ccs. soda lye (sp. gr. 1.34) and 160 ccs. water until solution results, after which enough water is added to make the whole measure 1155 ccs. 10 ccs. of this solution correspond to 0.05 g. glucose. Compare *Fehling's* solution.

Loewenthal's reagent for glucose is a solution of 60 g. tartaric acid, 240 g. sodium carbonate and 5 g. crystallized ferric chloride in 500 ccs. of hot water. Glucose solutions or diabetic urine when boiled with this solution cause a brown precipitate.

Loof's reagent for morphine is *Froehde's* reagent in various concentrations, whereby various changes of color are produced. (For details see Apoth. Ztg., 1895, 449.)

Lochini's reagent for alkaloids is a solution of potassium bichromate in hot concentrated sulphuric acid. Veratrine gives a yellow coloration with this reagent.

(To be continued.)

MONTHLY REVIEW.

Commercial Reports.

East Indian Drugs.*

Tinospora cordifolia Miers. (**Menispermaceæ**). The stems and roots of this climber native in tropical India and Indo-China furnish the long known drug *Gulancha* of Indian medicine. The drug apparently finds wide use as a fever remedy, also in secondary forms of syphilis, in rheumatism, and snake bites. Concerning the constituents we know but little. A small quantity of an alkaloid which seems to be berberine has been found, further, a bitter tasting substance of glucosidal nature. A chemical investigation of this not uninteresting drug will, it is to be hoped, give further information.

Toddalia aculeata Pers. (**Rutaceæ**). The root before us is the drug designated since the second half of the 17th century "Lopez root," named after Juan Lopez Pineiro, who in 1671 first brought it from the east coast of Africa to Europe. It is, however, doubtful whether this first Lopez root which came from Zanzibar is identical with our drug which comes from a plant found in India, Ceylon, Southern China, the Archipelago and Mauritius. The drug seems in general up to the latest times to have come but sparingly into commerce. It is used, apparently with good results, as a tonic and stimulant, especially in fevers and dysentery. The active principles are confined to the bitter tasting bark exclusively, the tasteless wood being regarded as worthless. Concerning the constituents of the drug, the thorough study of which would be of interest, we know little. From it an ethereal oil whose odor recalls cinnamon and melissa, and a resin have been isolated—both coming from the secretory reservoirs—also a bitter principle.

The drug consists of pieces often much flattened out, reaching a length of 20 cm. and a thickness of 4 cm. The wood is pale yellowish. The bark, even in large pieces, is only 1.5 mm. thick, brownish in cross section, externally bright yellow, covered with a cork which is easily rubbed off. The wood has narrow medullary rays, 1 to 2 cell rows wide. The cells are radially elongated, pitted. The wood rays contain many vessels and strongly thickened fibres; wood parenchyma very sparingly present.

Exteriorly the bark shows a strong cork layer which consists of unthickened, rather high cells. The primary bark contains parenchyma with single crystals, secretory cells and groups of fibres. The inner bark shows medullary rays which are 1 to 3 cell rows wide. The cells are radially elongated and occasionally contain isolated crystals of oxalate. Toward the outside, the medullary rays broaden out in a fan-like form. They are unusually high, in tangential section some were found as much as 60 cells high. The fibres, not strongly thickened, appear as slightly marked tangential bundles in the bast. In the soft bast tangential groups of small, collapsed sieve-tubes are seen, the sieve plates of which are oblique in an insignificant degree. In the bast rays many single crystals of oxalate are present in rather long, axial rows of cells and surrounding the fibre bundles, as well as secretory reservoirs with yellowish, granular contents.

Moeller (Baumrinden, p. 327) noticed in **Toddalia aculeata** the appearance in the stem bark of undoubted lysigenous oil spaces as is the normal thing in the *Rutaceæ*. We desire, however, to observe that in the drug investigated the oil spaces throughout give the impression of being simple, little-enlarged cells. Of course, this point can be established beyond doubt only by a study of the development in fresh material.

Vernonia anthelminthica (L.) Willd. (**Compositæ**). This plant occurs in all parts of India. Its achenes are a favorite remedy for intestinal worms. Out of the crushed fruits an electuary is made with honey: this is given in two doses of three grams each within a space of a few hours, after which a purgative is administered. The fruits are black, longitudinally striate, with remains of the pappus at the upper end; they reach a length of 6 mm. and a breadth of 1 to 1½ mm. According to Dymock (Pharmacographia Indica II, p. 242) the seeds are said to contain an alkaloid. Since according to our present knowledge, the occurrence of an alkaloid in the family of the *Compositæ* must be regarded as at least doubtful, it seemed desirable to confirm this statement. The investigation of a considerable quantity of the drug gave no trace of an alkaloid. A brownish-green, bitter-tasting, fluid oil was found (17.3 p. c.) and a small quantity of a likewise bitter-tasting, greenish-brown resin.

Vitex negundo L. (**Verbenaceæ**). The drug transmitted to us under this name has unfortunately proved to be an entirely different thing, namely, the rhizome of a fern, perhaps a *Polypodium*. It is, therefore, impossible to make a report on this drug. It is only to be mentioned that the leaves of *Vitex negundo* L. as well as those of *Vitex trifolia* L. in India find use externally as applications in strains, contusions and the like.

Novelties in Volatile Oils.

Quipita-wood Oil. We have recently received from Venezuela a small lot of a wood which seems as yet not to have been submitted to distillation. It had a light color, a very dense structure, without being specially hard and heavy, and consisted of stems several metres in length and 5 to 20 cm in diameter. The thicker stems have a thin, white exterior bark and resemble birch stems. The bark of younger stems has a grayish-yellow color.

By distillation of the rasped wood one per cent of a light-yellow oil was obtained. Its odor recalls that of turpentine oil and is not agreeable, so that it can not have any use in perfumery. Its optical rotation is 33° 31′ laevogyrate at 18° in a 100 mm. tube; the specific gravity is 0.934 at 15° C., its figure of saponification — 2.9 indicates that only a small amount of ester is contained in the oil. The saponification figure after acetylization is 40.2, showing that the amount of alcoholic constituents is also inconsiderable.

Pine-needle Oils. In supplementing our former Reports (October 1892, page 53; April 1893, page 55; October 1893, page 33; October 1894, page 59; April 1895, page 35 and 74; October 1895, page 38 and April 1896, page 49, about the distillates from various coniferous products, we beg here to add some of the investigations made in the course of the present summer. Except the last named, the oils here described are our own distillates.

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* [Continued from p. 259.]

1. **Mountain Pine Oil,** distilled from the twigs of *Pinus pumilio* Haenke. The material for this and the following three oils was obtained from Hungary. The yield was 0.68 per cent, spec. gravity 0.8753 at 15° C.; opt. rotation — 5° 14′ at 23° C.; saponification figure 22.6, corresponding to an amount of 7.9 per cent of bornyl acetate.
2. **Mountain Pine Oil,** distilled of the wood of the branches of *Pinus pumilio*. Yield 0.27 per cent; gravity 0.8847 at 15° C.; opt. rotation — 2° 57′ at 23° C.; saponification figure 25.9, corresponding to an amount of 9.1 per cent of bornyl acetate.
3. **Mountain Pine Oil,** distilled from twigs obtained also from Hungary, but from another district than 1 and 2. Yield 0.71 per cent; spec. gravity 0.882 at 15° C.; opt. rot. — 6° 35′ at 17° C.; saponification figure 15.3, equal to 5.4 per cent of bornyl acetate.
4. **Mountain Pine Oil,** from cones one year old. Yield 0.21 per cent; spec. gravity 0.925 at 15° C.; opt. rotation — 7° 5′; saponification figure 7.3 equal to 2.5 per cent of bornyl acetate.
5. **Pine-needle Oil,** distilled from fresh twigs of a second crop from *Pinus sylvestris* L., obtained from the extensive forests in the neighborhood of Torgau, Province of Saxony. Yield 0.55 per cent; spec. gravity 0.884; opt. rotation + 7° 13′ at 16° C.; saponification figure 9.2, corresponding to 3.2 per cent of bornyl acetate. The dextrogyrate rotation agrees with that of a pine-needle oil distilled and examined by us some time ago. We note this fact, because Mr. Umney found a laevogyrate rotation with two distillates obtained from needles of the Scotch fir (also *Pinus sylvestris* L.) (see Report, April 1896, page 50).
6. **Italian Turpentine Oil.** Our own distillate obtained from the turpentine of the red-fir (*Pinus Picea* L.) in the neighborhood of Naples. Yield 18.3 per cent, spec. gravity 0.866 at 15° C.; opt. rotation + 3° 5′ at 18° C.; saponification figure = 0. The oil has a fine pine odor, it could, however, become of practical use only if it could be obtained at a much lower price.
7. **Pine Resin Oil,** distilled from a rather soft resin, obtained from Amsterdam and said to come from America. Yield 10.9 per cent; spec. gravity 0.870 at 15° C.; opt. rotation + 12° 0′ at 23° C.; saponification figure 8.4. The oil has the odor of common oil of turpentine and therefore is unfit for perfumery.
8. **Siberian Pine-needle Oil.** This oil is very likely the kind examined by Mr. Hirshsohn some years ago, which was remarkable by a high percentage of bornyl acetate.

   Our present oil has the spec. gravity of 0.911 at 15° C.; opt. rotation — 41° 9′ at 19° C. Upon saponification by an alcoholic solution of potassium hydrate, its ester-amount was found to be 35.5 per cent.

   For the purpose of further examination, the saponified oil was distilled by steam and subsequently submitted to fractional distillation. The first considerable fraction had the boiling point at 160 to 163° C. and was laevogyrate, — 44° 25′ at 18° C. Camphene was not found in the fraction, but a nitrosochloride was readily obtained which, when treated with benzylamine, yielded pinenenitrolbenzylamine, melting at 122–123° C. The further fractions contain laevogyrate borneol accompanied by another body, probably terpineol.

   Siberian pine needle oil, therefore, contains laevogyrate-pinene, laevogyrate-bornyl acetate and probably also the acetic ester of terpineol.

Mr. J. H. Hart, Superintendent of the Botanical Department at Trinidad, kindly furnished us with a small sample of a new oil, for which favor we beg to return our thanks. The oil is obtained from the leaves of a *Pimenta* species not yet classified, has a light yellow color and strong lemon-like odor; its spec. gravity is 0.882 at 25° C., its opt. rotation — 0° 37′ at 25° C. in a 100 mm. tube. The distinct odor of citral induced us to ascertain the presence of this body by the chemical reaction; we easily obtained citryl-β-naphtocinchoninic acid, proving the presence of citral in this oil.

As usual we have to record the receipt of some novelties from the botanical garden at Buitenzorg on Java. Dr. Van Romburgh kindly sent us a small sample of the ethereal oil of *Lantana Camara*, a weed common in Java. The oil has not a pleasant odor, a spec. gravity of 0.952 at 15° C. and is laevogyrate by 0° 24′ at 17° C. in a 100 mm. tube.

The same consignment included a sample of acetone obtained by distillation from the leaves of the well-known India rubber plant *Manihot Glaziovii* J. Mueller. It may be added that Dr. Van Romburgh has succeeded in showing the presence of acetone in the leaves of several plants, for instance in the cocoa leaves (*Erythroxylon Coca* Lam. *var. Spruceanum* Brck.) and in the leaves of the flowering patchouli plant (*Pogostemon Patchouli* Pelletier).

In a paper on the fruits of *Piperaceae*, recently published in Archiv der Pharmacie 234 (1896), page 204, Karl Peinemann describes the essential oil of the fruits of *Piper Lowong* Bl., growing in Java. He has obtained the oil partly by distillation of the powdered fruits, partly by distillation by steam of the ethereal extract prepared from the distilled fruits. The oil obtained by the first method has a spec. gravity of 0.865, the one obtained by the second method, of 0.924. The total yield of oil was 12.4 per cent. When it was submitted to fractional distillation in a vaccum under 17 mm. pressure, the thermometer being allowed to rise to 170° C., the larger part of the oil passed over at 80° C., a considerable part at 110–148° C. From the latter fraction needle-shaped crystals, melting at 164° C., separated on standing. Their small amount admitted only one ultimate analysis, yielding results which suggest the improbable formula $C_{10}H_{16}2H_2O$.

From fractions of juniper-berry oil with a high boiling point, we also isolated needle-shaped crystals, melting at 165 to 166° C., some time ago. The crystals obtained by Mr. Peinemann seem to be so similar to those previously obtained by us that they admit the inference that they are identical.

[Semi-Annual Report of Schimmel & Co.]

Chemistry.

Boric Acid and Borates.

Louis Kahlenberg and Oswald Schreiner report on an investigation of boric acid and its salts by physical chemical methods. The investigation throws considerable light upon the complex character of the acid and its salts as they have found that only one boric acid exists in solution. The results are briefly these:

1. In aqueous solutions there exists only one boric acid, H_3BO_3, which is formed immediately when its anhydride or partial anhydride is dissolved in water.

2. A solution of crystallized borax is the same as a solution of the equivalent quantities of boric acid and sodium hydrate.

3. In concentrated solutions of borax there exist Na ions and anions containing two boron atoms and not four as had hitherto been assumed. These anions are split up hydrolytically, so that in dilute solutions there exist Na ions and anions containing only one boron atom, besides nearly undissociated boric acid.

4. A solution of sodium metaborate is the same as a solution of the equivalent quantities of boric acid and sodium hydrate or of borax and sodium hydrate. This solution contains but a slight amount of hydroxyl ions, and the salt is therefore but slightly decomposed hydrolytically by water. No further combination takes place when more than 1 mol. of sodium hydrate to 1 mol. of boric acid is added, as nearly the entire excess of hydroxyl ions was found.

[Zeitsch. f. phys. Chem. 20, p. 547.]

Borates and Polyhydric Alcohols.

The same authors also report their results of the investigation of the combinations which borates form with the polyhydric alcohols. This reaction has been the subject of numerous investigations since 1841, but a satisfactory investigation has hitherto been impossible. By applying the newer physical-chemical methods to this problem the authors have succeeded in throwing a ray of light upon this troublesome problem. Mannit was thoroughly investigated, while erythrit, glycerol and dulcol were investigated only so far as to show that they produced the same general effect. The result is very briefly as follows:

1. Mannit combines with boric acid to form a complex boromannitic acid, which, being a stronger acid, is more readily dissociated and gives rise to hydrogen ions and boro mannitic anions. These anions are broken up hydrolytically by dilution with water.

2. Mannit combines with borax to form the acid sodium salt of the complex boromannitic acid. In such a solution there are present Na ions, H ions and anions containing two boron atoms combined with two mol. of mannit. These complex anions are hydrolytically split up by dilution with water.

3. In solution of sodium monoborate the same reaction takes place except that no hydrogen ions can be formed. There are present in solution Na ions and anions containing two boron atoms and two mol. of mannit.

4. The compounds formed by the other polyhydric alcohols are similar to that of mannit. The compound formed with erythrit is not so stable as that of mannit but more so than either glycerine or glycol, the latter being the least stable.

[Zeitsch. f. phys. Chem. 20, p. 547.]

Alums Containing Nitrogen-Bases.

The alums thus far prepared from substituted ammonias contain non-aromatic bases or such aromatic bases as can be derived from aromatic alcohols. Alums from acid amids and amido acids apparently have not been described. Several alums containing alkaloids have been described; viz., an aluminium alum of coniine, an iron alum of quinine, and one from the alkaloid of *Heradeum asperum*. The last mentioned was prepared by Kirschmann, who suggests the formation of alkaloidal alums as a method for the isolation of alkaloids. N. Orlow, who last year described a cocaine alum,* has therefore made a more detailed study of the capacity of alkaloids to form alums. Positive results were obtained with piperidine, coniine, ecgonine, cocaine, atropine, quinine, sparteine; negative results with pyridine, pilocarpine, berberine, morphine, codeine, chelerythrine.

Pyridine derivatives, morphine, chelerythrine like true aromatic amines do not form amines, whereas hydropyridine derivatives do. The capacity to form alums on the part of some so-called fatty bases was also studied.

[Pharm. Zeitsch. f. Russl. 35, pp. 465, 481 & 497.]

The Chemistry of Resins.

At the last meeting of German Scientists and Physicians Prof. A. Tschirch gave a summary of the interesting studies by himself and students on the chemistry of the resins, or more particularly of the resinous constituents of gum-resins. These constituents are classified into three principal groups:—

1. Resines (resinesters) or their saponification products.
2. Resinol acids (resin acids).
3. Resenes (indifferent substances of unknown classification).

Only a few resins contain representatives of all three groups.

I. The aromatic acids obtainable from the resins are benzoic acid and cinnamic acid as well as derivatives of both:

a) Benzoic acid (Peru balsam, tolu balsam, Siam benzoe, dragons' blood);

b) Cinnamic acid (Peru balsam, tolu balsam, styrax, Sumatra benzoes, yellow akarvoid resin);
  [β-Phenylhydracrylic acid (probably in dragons' blood)];
  p-cumaric acid (in yellow and red akarvoid resin);
  Ferulic acid (in asafetida);
  Umbelliferone (in asafetida, (galbanum sagapen).

c) Of the fatty acids succinic acid only has been thus far found, viz., in amber.

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[*] Pharm. Zeitsch. f, Russl., 1895, No. 37]

II. The resin alcohols obtained from the resines are either colorless and do not yield the reaction for tannin: resinoles—or colored and yield the reaction for tannin: resinotannoles.

a) Known resinoles are:
  Succinoresinol in amber,
  Storesinol in styrax,
  Benzoresinol in benzoes,
  Chisonol in opopanax.

b) Resintannols:
  Siaresinotannol in Siam benzoes,
  Sumaresinotannol in Sumatra benzoes,
  Peruresinotannol in Peru balsam,
  Toluresinotannol in Tolu balsam,
  Galbaresinotannol in galbanum,
  Ammoresinotannol in ammoniacum,
  Sagaresinotannol in sagapene,
  Dracoresinotannol in dragons' blood,
  Panaxresinotannol in opopanax,
  Xanthoresinotannol in yellow akarvoid resin,
  Erythroresinotannol in red akarvoid resin.

Several of these resinotannols are, no doubt, related. The readiness with which they form picric acid seems to indicate that they contain a hydroxy group in the benzene nucleus.

III. The resinolic acids occur free in the resins and as far as examined are all oxy acids:

Podocarpinic acid in podocarp resin,
Abietinic acid in colophony,
Pimaric acid in "Fichtenharz",
Succinoabietic acid in amber,
Sandaracolic acid in sandarac,
Callitrolic acid in sandarac,
Trachylolic acid in copal,
Isotrachylolic acid in copal,
Dammarolic acid in dammar,
Guaiac resin acid in guaiac,
Guiaconic acid in guiac,
Copaivic acid in copaiba balsam.

Some of these, without doubt, are also related. Remarkable is the stability of many resin acids against fused potassa and the fact that abietic acid as well as succinoabietic acid yield succinic acid when fused with potassa.

IV. The resenes reveal a great stability toward reagents and therefore cannot be classified at present:

α-Panaxresene in opopanax,
β-Panaxresene in opopanax,
α-Dammarresene in dammar,
β-Dammarresene in dammar,
Fluacol in guttapercha,
Alban in guttapercha,
α-Copalresene in copal,
Dracoalban in dragons' blood,
Dracoresene in dragons' blood,
Myroxoresene in the fruits of myroxylon.

Although these results have proven of no practical value so far, it must be remembered that the examination of resins, which are complex mixtures, is an impossibility as long as the individual constituents are not better known. Ultimately, no doubt, these results will revolutionize the present pharmacopœial methods for the examination of resins, gum-resins and balsams.

[Pharm. Centrh. 37, p. 664.]

Botany and Pharmacognosy.

CS_2-forming Fungi.

Sometime ago the presence in the Black Sea and the Sea of Azov of bacteria forming CS_2 was reported in the periodicals. T. A. Went finds in Java on dead stems of bamboo and sugar cane and on other decaying vegetable matter, CS_2 to be formed by the common fungus *Schizophyllum lobatum*. The mycelium forms peculiar, short, lateral branchlets, at the tips of which droplets of a strongly refracting liquid having the odor characteristic for CS_2 appear. When cultivated on a sugar-peptone nutrient solution, this fungus forms CS_2 in small quantities. The amount varies according to not clearly understood conditions.

[Apoth. Zeit., 11, p. 738.]

Adulteration of Blood Root.

Mr. E. M. Holmes reports a sample of *Sanguinaria Canadensis* adulterated with the root of the False Unicorn, *Chamælirium luteum*. The adulteration amounted to about 90 percent and was unintentional since the adulterant is worth several times as much as the blood root. The rhizome of *Chamælirium* is almost identical with the blood root in size and general appearance. The rootlets are evidently those of a monocotyledonous plant, since they are not continuous with the outer surface, each leaving a small hole when broken thus giving to the rhizome a perforated appearance not seen in *Sanguinaria*. It is also distinguished by the grayish color of the external surface and in the transverse section by a well defined central column occupying about one third of the diameter. No resinous dots marking the secretory reservoirs are seen as is the case in *Sanguinaria*. [Pharm. Journ., July 11, 1896.]

Spurious Jaborandi Leaves.

Genuine jaborandi leaves (*Pilocarpus Jaborandi*) have for several months been a scarce article in the drug markets. Mr. Holmes remarks that the Maranham jaborandi (*Pilocarpus microphyllus*) has met with a ready sale in Germany; its leaves are quite small but contain a good percentage of pilocarpine. This form has lately been adulterated with a leaf that resembles it very closely in form and size and cannot be detected by the casual observer. The leaf, however, differs from the jaborandi leaf in the absence of oil-glands in its tissues, and, therefore, will not yield pilocarpine. For practical purposes the leaves — or more properly the leaflets — may be recognized by the absence of oil cells, by their reticulated venation (the veinlets being usually pellucid), by not tapering to a narrow base, and by the very short hairy petiolule, about one millimeter long, The upper surface is glossy, of a brownish-green tint, not grayish-green as in *P. microphyllus;* the midrib on the upper surface is minutely hairy and the lateral veins form more acute angles with the mid rib. Usually there are small, rounded or oval leaflets about half a centimeter long, mixed with larger leaflets, which average 2½ to 3 centimeters; these are never present in the true Maranham jaborandi. The presence of these small leaflets should therefore at once serve the unaided eye as a guide to the presence of the spurious drug. From the fragments of the flowers and fruits that were found in the sample, and with assistance from Kew, Mr.

Holmes was enabled to place the tree producing the leaves in the genus *Swartzia* in the *Leguminosæ*. After a comparison of the material with known species of this genus, the conclusion was reached that it was an undescribed species, which Mr. Holmes names provisionally *Swartzia decipiens*.

[Bull. of Pharm. 10, p. 462; from. Pharm. Journ., July 4, 1896.]

Hydrocyanic Acid in Plants.

Dr. Treub of the Botanical Garden at Buitenzorg announces most interesting and important results concerning the localization, transportation and rôle of hydrocyanic acid in *Pangium edule* Reinsd.

These results seem to be of unusual significance in plant chemistry.

This paper seems to throw some light on the steps in the formation of proteid by combination of the substances formed by assimilation in the leaves with substances absorbed by the roots. In *Pangium edule* large quantities of hydrocyanic acid occur, either free or in an unstable combination. The substance is obviously of great importance in the metabolism of the plant. In the stem and roots it occurs chiefly in the phloem, while in the leaf it occurs in most of the parenchyma cells, but also in certain specialized cells of the epidermis. To these last, Dr. Treub assigns the formation of the acid. By various experiments, he showed conclusively that it is transported through the phloem. For its appearance in the leaves he found certain conditions necessary. He could not prove that the presence of carbohydrates was required but in the absence of light and carbon dioxide the acid rapidly disappeared from the leaf. It would appear, then, that the carbon and hydrogen of hydrocyanic acid come from assimilated carbohydrate, while the nitrogen must be obtained from material absorbed by the roots.

In accordance with this supposition, Dr. Treub found that interference with the supply of water tended to prevent the appearance of hydrocyanic acid in the leaf; thus if the vascular bundles of certain lobes only of a leaf be cut, these lobes continue to grow, but much less of the acid appears in them than in the uninjured lobes. The connection between water-supply and the absence of hydrocyanic acid is also borne out by another very interesting observation; it was found that the lowest leaf on the plant was entirely or almost entirely free from hydrocyanic acid; but, on removal of all the upper leaves of the plant, hydrocyanic acid soon appeard in the lowest leaf, the reason being, as Dr. Treub believes, that this leaf has now the whole water-supply to draw upon, and so is no longer starved for want of nitrogen salts.

From a study of the conditions for appearance of hydrocyanic acid in the leaves, Dr. Treub concludes that in *Pangium edule*, at least, "hydrocyanic acid is the first recognizable product of nitrogen assimilation." He believes that the carbohydrate formed in ordinary assimilation is combined with nitric acid (set free by the vegetable acids from the nitrates absorbed by the soil) to form hydrocyanic acid, and that this, by further anabolic change is converted into proteid.

[Natural Science, 9, p. 150; from Annales du Jardin Botanique de Buitenzorg, 13^{I}.]

Maté Plants.

Dr. Th. Loesener has given careful study to the Maté plants of South America and brings out many interesting facts.

Maté is understood to mean a tea-like drink, which is prepared by the natives and also by the European settlers in Paraguay, Argentine and Brazil, especially from the leaves and young twigs of *Ilex Paraguariensis* St. Hil. Originally the word was used to designate the vessel in which the beverage was prepared, a hollowed-out gourd, but it has been carried over to the tea itself. The species mentioned, although the principal plant used, is not the only one. *Ilex amara* (Vell) Loes., *I. affinis* Gardn., *I. theezans* Mart., *I. Cuyabensis* Reiss., *I. dumosa* Reiss., *I. diuretica* Mart., *I. conocarpa* Reiss., *I. pseudothea* Reiss., *I. Glazioviana* Loes., *I. congonhinha* Loes., as well as *Villarezia Congonha* (D C.) Miers. from the family *Ilicineæ* and *Symplocos* species are used for this purpose. The author, however, in the samples examined found but three species, *I. Paraguariensis*, *I. amara* and *I. dumosa*.

In addition to the systematic and anatomical study of the plants concerned, many facts of more general interest find mention. Enormous quantities are exported from the centers of production to the neighboring states. In 1870—71, Brazil exported 9½ million kilograms, in 1869, the Brazilian province Paraná alone exported 12 million kilos. The importing countries are Chili, Bolivia and Peru, the export to Europe being very small. In 1878, it was estimated that the total consumption of Maté per year in South America reached the sum of 100 million kilos. This is equal to 9 kilos per capita or 200 liters of Maté. The preparation of this beverage by the native Indians was already important before the European immigration, and the herb was one of the important articles of trade among the natives. Extensive cultivation of the Maté plants existed in the years 1609—1769, at the time of the Jesuit rule at the Missions between Uruguay and Paraná,

The caffeine-content varies according to condition and treatment of the leaves. Fresh, unroasted, dried leaves contained 1.675 percent, while the dried leaves of commerce contained but 0.55 percent. The altitude of the region in which the plant grows, the time of year and the care used in preparation all influence the content. The tea stimulates without exciting, stills the thirst and is also said to be nutritious.

The drink is made by pouring boiling water on the prepared leaves. The first decoction is usually too strong and is thrown away. The succeeding draughts are preferred. The same leaves are used two or three times by adding a few fresh leaves each time or by boiling the leaves two or three times for as many minutes.

The endeavor to introduce this beverage in Europe has met with no success, although Europeans immigrating to South America take kindly to it.

[Ber. d. Deutsch. Pharm. Gesellsch. 6, p. 203.]

Medicinal Plants of Brazil.

Dr. Theodor Peckolt reports on the species of *Magnoliaceæ*, *Talauma ovata* St. Hil. and *Michelia Champaca* L., as follows:

Talauma ovata is a native of the tropical states, especially in the Organ Mts. It grows in moist locations, forms a beautiful tree reaching 20 m. in height, with large, leathery, oval or rounded obovate shining dark green leaves. Flowers about 6 cm. diameter, dull white, with faint perfume. The leaves are popularly used in place of tea. 10 kilogr. of fresh leaves yielded no ethereal oil, although when crushed they have an agreeable odor. Fresh and dried leaves were investigated. There was found: Water, 55.0; wax, 0.18; α soft resin, 0.672; β soft resin, 2.655; indifferent resin, 1.417; resin acid, 8.818; cumarin, 0.037; tannin, 0.41; extract etc., 9.77; ash, 3.4 percent. To the cumarin-content, the leaves owe their fragrant odor. One kilo of dried leaves gave but 0.822 grm. cumarin. The odorless, weakly styptic tasting bark is not used. Cumarin was not found in it.

Michelia Champaca L. This plant, although not a native of Brazil, is much cultivated, being planted in parks, boulevards, etc. The fragrant flowers are macerated in castor oil, obtained by boiling out with water (mammonia oil) and used as a hair oil. The air-dried seeds when crushed form an oily mass yielding on expression 27.3 percent oil. When extracted with petroleum ether they yield 32.157 percent fatty oil which is yellowish-red, thickly fluid, with a faint odor like copaiba balsam.

Of the *Winteraceæ*, Peckolt reports on the various varieties of *Drimys Winteri* Forst.

Var. *granatensis* Eichl. is found in all the tropical and subtropical states from Rio de Janeiro to Rio Grande do Sul, where it is called by the people "*Canella brancha*", "*Canella Meladinha*". It is a tree reaching a height of 20 meters. Stem with grayish-white bark, alternate leaves, leathery, oblong-obovate or oblanceolate, the upper side shining dark green, beneath dull green, white-punctate. Flowers on the axils of the upper leaves, white, fragrant. Fruit a black berry, 6 to 13 mm. in diameter. Formerly the erroneous view existed that coto and paracoto barks were derived from *D. Winteri*. The three varieties here mentioned occur in all states, while coto and paracoto barks are derived solely from the equatorial states.

The bark of var. *granatensis* consists of broad, irregular pieces, 4—15 cm. long. The thickness is very variable, the stem and branch bark mixed from 2 to 8 mm., more or less rolled, externally ashy-gray, internally yellowish-brown. In cross section, three layers are noticed: a thin, gray or yellowish-gray cork layer, a reddish, yellowish-brown, middle layer with yellow points, and the (when fresh) yellowish-red bast layer. Fracture uneven, not fibrous. Odor faint, on crushing agreeable, aromatic, similar to a mixture of cinnamon and Jamaica pepper, taste burning-aromatic. The bark is used as tonic and stimulant.

Var. *revoluta* Eichl. Found in the states Bahia, Goyaz, S. Paulo, Minas and Rio de Janeiro. A tree 8 to 12 m. high, with crowded, stiff, coriaceous leaves. The fragrant flowers are white. The bark, sometimes called tapir bark since it is eaten by the tapirs, is ashy-gray externally, wrinkled with deep fissures, middle layer sulphur-yellow to light brown, marbled; bast layer yellowish-white. Odor weakly aromatic, with bitter somewhat biting, aromatic taste. A favorite and much used popular remedy in stomach troubles, flatulence, leucorrhoea, etc.

Var. *angustifolium* Eichl. Is found in the southern states; occurs both as shrub and tree. The bark resembles that of var. *granatensis* and it is used in a manner similar to var. *revoluta*. The German colonists at Joinville make an imitation of angostura bitters from the bark. Apothecary E. Schmidt obtained on distilling the bark 0.9 percent of a colorless, ethereal oil. This in small dose with castor oil is used as an active anthelmintic. The bark was introduced into Europe in 1776. In 1851, genuine coto bark from South America was brought to England under the name "*Cortex Winteranus*". As a result of this mistake, coto bark was assigned by some pharmacognosists to *D. Winteri*.

In 1889, Gustav Peckolt analyzed the fresh bark of var. *revoluta*. He found: water, 25.5; ash, 2.55; ethereal oil, 0.58; resin, 7.17; drymin, 0.3; drymic acid, 0.078 percent.

Dr. Theo. Peckolt himself obtained from the leaves: Water, 52.5; wax, 0.333; fat, 1.05; resin, 3.9; amorphous bitter principle, 0.6; extractive, 11.833; ash, 2.375 percent. Tannin, ethereal oil, drymin and drymic acid were not found.

[Ber. der Deutsch. Pharm. Gesellsch. 6, p. 157.]

Denitrifying Bacteria.

The study of the relation between the presence of bacteria in the soil and the ability of green plants to utilize free atmospheric nitrogen has brought to light two opposing kinds of bacterial action. One class, the nitrifying bacteria, by their action in the soil and the tubercle-forming bacteria by their symbiosis with the roots of leguminous plants bring free nitrogen into compounds available for use by green plants. Another and more recently discovered class, the denitrifying bacteria, operate in the opposite manner and free the nitrogen from its compounds, returning it to the atmosphere. Since the organic world continues to exist and increase, the preponderance of effect plainly lies with the first class.

It has been shown by Prof. Wagner of Darmstadt, that in horse dung bacteria are present that break down saltpeter and return the nitrogen to the air, causing, therefore, nitrogen fermentation. Winogradski of St. Petersburg and A. Stutzer and R. Burri in Bonn have isolated and studied the characteristics of the organisms fermenting horse dung. Stutzer and Burri found certain distinct organisms working together at the same time in the culture medium. One was identified as *Bacterium coli communis*, liquifying gelatine, forming no spores, facultative anaerobic. The second kind, obligative aerobic, not liquifying gelatine, forming no spores, was regarded as a new species, and was named *Bacterium denitrificans* I.

Old straw was likewise found to contain some organism that excite a nitrogen fermentation similar to that seen in horse dung. Further study of the same revealed two forms of bacteria, one large and one smaller. The larger was regarded as *Bacillus subtilis*, the smaller kind was undescribed and was named *Bacterium denitrificans* II. Here the smaller form was able alone to break up nitrates and nitrites setting free nitrogen. *B. coli communis* and *B. denitrificans* I, in an oxygen-free atmosphere caused the change of the nitrates to nitrites, no free nitrogen being formed. A limited supply of air permitted nitrogen fermentation, which when begun proceeded rapidly. An abundant air supply caused the fermentation to nearly or quite cease. *B. denitrificans* II, on exclusion of air, fermented potassium nitrate in the normal manner. By an abundant air supply fermentation quite stopped.

As a practical conclusion to be drawn from the above the author declares that horse manure with the contained denitrifying bacteria is harmful when put upon the soil, causing a loss of available nitrogen. To make it harmless it must be sterilized while still fresh by treatment with acids and the soil with which it is to be manured must be thoroughly loosened up, to allow free access of air.

[A. Vogel in Apoth. Zeit. 11., p. 704.]

Medicinal Plants of African Natives.

The following plants are used by the natives in the region of the German East African posessions in their medical practice. Since many of these plants play a more or less important rôle in European medicine, names and uses are here given.

Anthelmintics — *Hagenia abyssinica* Willd. (Hepah, Habi), the flowers alone are mixed with *Olea chrysophylla* Lam. (Awle), *Jasminum floribundum* R. B. (Habbi tsalim), *Phytolacca abyssinica* Hoffm. (Schebtzi), *Verbascum ternacha* Hchst. (Tirnaha), *Croton macrostachys* Rich. (Tambusch), *Bryonia scrobulata* Hchst. (Hoffa-falo), *Buddleya polystachyca* (Maddere), *Euphorbia depauperata* Hchst., which are in part intended to improve the taste and in part to serve as purgative. Further, *Punica granatum* L. bark of root; *Cyperus articulatus* L. rhizome; *Celosia trigyna* L. (Belbelta); *Phytolacca abyssinica* Hoffm., fruits; *Albizza anthelmintica* Br. (Kosala), bark; *Moghania rhodocarpa* Ktze. (Waras, Kamala). [Confusion appears to exist here, since Flückiger and Hanbury have shown Waras to be a thing distinct from Kamala — Pharmacogr. p. 575 R. H. T.] *Croton macrostachys* Rich. (Tambusch); *Myrsine africana* L. (Tatze), fruits; *Measa lanceolata* Yorsk (Soaria), fruits; *Olea chrysophylla* Lam. (Awle), leaves; *Jasminum abyssinicum* Hchst., leaves; *Gomphocarpus lineolatus* Desc., leaves; *Sarcocephalus sambucina* Winterb., roots.

Purgatives. *Cassia acutifolia, angustifolia* and *obovata*, follicles; *Tamarindus indica* L. (Subar Mquadschu), fruits; *Ricinus communis* L., seeds; *Rumex abyssinica, nervosa* and *Stendelii*, stem and roots used especially for colic in cattle; *Argemone mexicana* L., the entire plant; *Macrura Angolensis* L., leaves; *Securidaca longepedunculata* Yres., leaves; *Jatropha Curcas* L. and *J. multifida*, seeds; *Euphorbia depauperata* Hchst., roots and seeds; *Cucumis pustulata* Hock., root.

Diuretics. *Boerhavia paniculata* Rich. (Kudo), root; *Cissampelos Pareira* L. (Kischikie-oha-buga), root and bark; *Jateorrhiza Columbo*, root and bark; *Argemone mexicana* L., the whole plant.

Febrifuges and **Antidysenterics.** *Jateorrhiza Columbo, Areca Catechu* L. (Mpopoo), seeds, *Hydnora abyssinica* A. Br., rhizome; *Acacia arabica* Willd. (Babul, Bablah, Garrat), bark; *Caesalpinia Bonducella* Roxb. (Mkomwe, Munga), bark and leaves; *Biophytum sensitivum* DC. (Kiforongo, Faulongo), leaves; *Brucea antidysenterica* Mill., bark; *Gymnosporia obscura* and *senegalensis*, Loes., leaves; *Withania somnifera* L. (Sabere, Golla), leaves; *Morinda citriodora* L. leaves and bark; *Crossopteryx africana* Winterb. (M'taclombai), bark; *Vernonia Hildebrandtii* (Watschu), the entire plant.

Antipsorica. *Flagellaria indica* L., leaves; *Smilax Kraussiana*, root; *Argemone mexicana*, milk juice; *Acacia arabica*, bark; *Grewia inaequilatera* Garek., leaves; *Cissus adenocaulis* Stend., root; *Solanum pharmacum* and *ptoricum* Kl., the entire plant; *Calophyllum inophyllum* L., the juice obtained from incisions in the plant.

Vulneraries. *Boerhavia plumbaginea* Cav., leaves; *Phytolacca abyssinica* Hoffm., leaves; *Cassia Absus* L., seeds; *Jatropha Curcas* L., milk juice; *Ochna alboserrata*, bark; *Adenia venenata*, leaves and wood; *Solanum Schimperianum* Hchst., wood; *Solanum odoense*, fruits.

Remedies for Diseases of the Eye. *Mohlana apetala*, the entire plant; *Argemone mexicana* L., milk juice; *Capparis tomentosa*, leaves; *Cassia Absus* L. (Tschiuhim), seeds.

Antirheumatics. *Areca Catechu*, seeds; *Caesalpinia Bonducella*, oil extracted from seed; *Ricinus communis*, oil extracted from seed; *Cotaphyllum inophyllum*, oil obtained from fruits.

Tonics. *Areca Catechu, Boswellia Hildebrandtii*, resin; *Polygala aphrodisiaca*, root and tops; *Acalypha peduncularis*, entire plant; *Sida Schimperiana*, root; *Coffea arabica* and *Zanguebarica* as well as the seeds of *Cola* (*Sterculia*) *acurnina*.

Narcotics. *Cyperus articulatus*, root; *Argemone mexicana, Dalbergia Melanoxyla*, roots; *Olea chrysophylla, Datura alba* (Mnará, Mnará-bu), leaves, flowers and root bark. *Nicotiana Tabacum* L. and *rustica*.

Diaphoretics. *Andropogon Schoenanthus* L., leaves.

Cardiac. *Strophanthus Combe* (Combe, Gombi), seeds.

Poison antidotes. *Cerototheca sesamoides*, for the bite of the rattlesnake; *Solanum antidotum*, the juice of the fruit for arrow poison prepared from the seeds of *Strophanthus combe*; *Solanum duplosinatum*.

Various plants of the above, although not official are in parts already used in homeopathy and when better known will probably find use in allopathy.

[Pharm. Wochensch. 13, p. 288.]

New Remedies.

Urisolvin (Mahl),

a combination of chemically pure urea with lithium acid citrate, has recently been successfully employed as a diuretic and as a solvent for uric acid. It is especially recommended in uric acid diathesis and its results: gout, urinary calculi, rheumatism, etc.

Holzin, Holzinol and Sterisol.

In one of the sessions of the 68th meeting of scientists and physicians, Dr. Rosenberg of Berlin reported on the above named solutions of formaldehyde and their use as disinfectants and preservative agents. *Holzin*, first recommended by Dr. Oppenheim, is a 60 p. c. solution of formalin in methyl alcohol, intended for disinfecting objects by mere application. *Holzinol*, a modification of the before-mentioned, contains some menthol, not simply for the protection of the mucous membranes against irritation by the formaldehyde vapors, but also because of its beneficial action on the respiratory organs.

A 3 p. c. solution suffices to sterilize the floors of sickrooms by simple moistening with a rag, while actual tests have proved that all pathogenic germs succumb to a solution of 1 in 75,000. *Sterizol* is a solution of milk sugar, saturated with formaldehyde, and intended for internal administration. Doses of 0.01—0.06 g. did not injure the general health of patients nor change the constitution of the blood, as shown by microscopical examination. The urine was free from albumen. If the peptonized urine was employed as a nutrient medium for typhoid germs, it proved to be sterile, while in the control experiments there was an abundant growth visible. Dr. Rosenberg recommends sterizol for internal administration in tuberculosis, erysipelas, diphtheria, etc., and is at present engaged in new therapeutical investigations of the same.

Caffeine-iodol, a substitute for iodoform, is obtained by mixing alcoholic solutions of the components in molecular proportions.

Iatrol, an oxyiodomethylanilid, is an odorless, nonpoisonous antiseptic, produced by the action of nascent hydrogen upon an aniline derivative.

Iodothyrin is the new name under which "thyroiodin" comes upon the market. (For particulars see pp. 91 & 93, Vol. 14, of this journal.)

Glandular Preparations.

Among the numerous organo-therapeutical preparations which of late have come into use, and many of which have been mentioned in previous numbers of the "Review", the following have recently been placed upon the market in the form of tabloids by the firm of Burroughs, Welcome & Co., who recommend them as being free from decomposition products as well as from all unpleasant odor and taste: *Thyroid* tabloids, employed in myxoedema, cretinism, obesity etc.; *Cerebrinin* tabloids (gray brain matter), in brain disorders, melancholia and neurasthenia; *Didynin* tabloids (testicle substance), in general debility, hysteria, and as an aphrodisiac; *Ovarian substance* tabloids, in diseases of that organ; *Mammary gland* tabloids, in fibroma of the uterus, in menorrhagia, dysmenorrhœa etc.; *Parotid gland* tabloids, in ovarian fibroma, metrorrhagia, leucorrhœa; *Pituitary gland* tabloids, in acromegalia; *Red bone marrow* tabloids, in leucocythæmia, anæmic conditions, etc.; *Prostate gland* tabloids, in prostate hypertrophy; *Spleen substance* tabloids, in anæmia and chlorosis; *Suprarenal gland* tabloids, in functional disturbances of that gland; *Thymus* tabloids, in goitre; *Kidney substance* tabloids, in nephritis, uræmia, etc.; *Liver substance* tabloids, in jaundice, liver cirrhosis, etc.; *Lymphatic* tabloids, in lymphadenoma, exophthalmia and various glandular swellings; *Pancreas* tabloids, in diabetes mellitus, when due to disease of the pancreas; *Pineal gland* tabloids, in organic as well as functional diseases of the brain; *Salivary gland* tabloids, as a substitute for the gland in extirpation of the latter and in insufficient production of ptyalin; *Spinal cord* tabloids, in diseases of the brain and spinal cord; *Uterus wall* tabloid, in diseases resulting from the extirpation of the uterus; *Fallopian tubes* tabloids.

Knoll & Co. put up most of the above preparations in powder form, diluted with sugar of milk so that the preparations represent either the same or twice the quantity of the fresh organ.

Literary.

Books and Pamphlets Received.

P. Blakiston, Son & Co.—Philadelphia. An Illustrated Dictionary of Medicine, Biology and Allied Sciences. By Geo. M. Gould, A. M., M. D. Based upon recent scientific literature. Third edition, revised. One vol., pp. XVI, 1633.

Gebrüder Bornträger—Berlin. Lehrbuch der oekologischen Pflanzengeographie. Eine Einführung in die Kenntnisse der Pflanzenvereine. Von Dr. Eugen Warming. Deutsche, vom Verfasser genehmigte, durchgesehene und vermehrte Auflage. Von Dr. Emil Knoblauch, Privatdocenten der Botanik an der Universität Giessen. Ein Bd., pp. XII, 412. 1896. M. 7.00.

Chemical Publishing Co.—Easton, Pa. The Development of the Periodic Law. By F. P. Venable, Professor in the University of North Carolina. One vol., pp. VIII, 321. 1896. $2.50.

Verlag von Wilhelm Engelmann—Leipzig. Physikalisch-Chemische Propaedeutik. Unter besonderer Berücksichtigung der medicinischen Wissenschaften und mit historischen und biographischen Angaben. Von Professor Dr. Med. & Phil. H. Griesbach.

Erste Hälfte: Bogen 1—17. Mit Figur 1—44. 1895. M. 6.00.

Zweite Hälfte, 1. Lieferung: Bogen 18—37. Mit Figur 45—104. 1896. M. 7.00.

—— Grundriss einer Geschichte der Naturwissenschaften. Zugleich eine Einführung in das Studium der naturwissenschaftlichen Litteratur. Von Dr. Friedrich Dannemann.

I. Band: Erläuterte Abschnitte aus den Werken hervorragender Naturforscher. Ein Bd., pp. XII, 375. 1896. M. 6.00. Geb. M. 7.20.

Charles Scribner's Sons — New York. An Illustrated Flora of the Northern United States, Canada and the British Possessions from New Foundland to the parallel of the southern boundary of Virginia, and from the Atlantic Ocean westward to the 102d meridian. By Professor Nathaniel Lord Britton and Hon. Addison Brown. In three volumes. Vol. I, Ophioglossaceæ to Aizoaceæ, Ferns to Carpetweed. One vol., pp. XII, 612. 1896. $3.00 net.

Friedrich Vieweg und Sohn—Braunschweig. Ausführliches Lehrbuch der Pharmaceutischen Chemie. Bearbeitet von Dr. Ernst Schmidt, Professor der pharm. Chemie und Director des pharm.-chem. Instituts der Universität Marburg. Dritte vermehrte Auflage. Zweiter Band, dritte Abtheilung (Schluss des II. Bandes), pp. 1081—1770.

Akademische Verlagsbuchhandlung von J. C. B. Mohr — Freiburg i. B. und Leipzig. Zur Kenntniss der Isomerieverhältnisse bei den ungesättigten Säuren. Habilitationsschrift von Dr. Wilhelm Autenrieth, 2. Assistenten des chem. Universitäts-Laboratoriums der med. Fakultät zu Freiburg i. Br. Brochure, pp. 82. 1876. M. 2.00.

Verlag von Julius Springer—Berlin. Pharmaceutischer Kalender 1897. Mit Notizkalender zum täglichen Gebrauch nebst Hilfsmitteln für die pharmaceutische Praxis. Herausgegeben von Dr. H. Boettger and Dr. B. Fischer. In zwei Theilen.

I. Theil: Kalendarium, Schreib- und Notizkalender, Hilfsmittel für die pharmaceutische Praxis. Ein Bd., pp. 138.

II. Theil: Pharmaceutisches Jahrbuch. Ein Bd., pp. 180. Sechsundzwanzigster Jahrgang, 1897. M. 3.00.

Author—Milwaukee, Wis. Entwickelung und Bedeutung der Zahl und des Masses. Von Reinhold Patitz. Selbstverlag. Ein Bd., pp. VIII, 208. 1896. M. 1.50.

Artist. Anstalt J. E. Kirchners Witwe—Werschetz, Austria. Repetitorium der Pharmacie. Für Anfänger und Vorangeschrittenere unter Berücksichtigung der Pharmacopœa Austriaca editio septima. Bearbeitet von Carl R. Kreuz, Apotheker. Ein Bd., pp. 621. 1896.

Hermann Heyfelder—Berlin. Chemisch-technisches Repertorium. Uebersichtlicher Bericht über die neuesten Erfindungen, Fortschritte und Verbesserungen auf dem Gebiete der technischen und industriellen Chemie mit Hinweis auf Maschinen, Apparate und Literatur. Herausgegeben von Dr. Emil Jacobsen. 35. Jahrgang. 1896. Erstes Halbjahr. Erste Hälfte, pp. 1—116. Mit in den Text gedruckten Illustrationen. 1896.

U. S. Dept. of Agriculture—Washington, D. C. The Timber Pines of the Southern United States. By Dr. Charles Mohr. Together with A Discussion of the Structure of their Wood. Prepared under the direction of B. E. Fernow, chief of the Division of Forestry. Bulletin No 13 of the Division of Forestry, pp. 160. 1896

Reviews.

An Illustrated Flora of the Northern United States, Canada and the British Possessions from Newfoundland to the parallel of the southern boundary of Virginia, and from the Atlantic Ocean westward to the 102d Meridian. By Nathaniel Lord Britton, Ph. D., Emeritus Professor of Botany in Columbia University and Director-in-Chief of the New York Botanical Garden, and Hon. Addison Brown, President of the Torrey Botanical Club. In three volumes. Vol. I, Ophioglossaceæ to Aizoaceæ. pp. XII, 612, with 1425 illustrations in the text. Charles Scribner's Sons, New York. 1896. $3.00 net per volume.

As stated by the authors in the introduction, this is the first work published in this country which purports to be a completely illustrated flora. It will certainly meet with a hearty welcome from the botanists of the country, especially those whose herbarium facilities are limited. The comparison of object with object affords of course the most satisfactory basis of identification. Next to this comes comparison with correct and well executed illustrations. The present work when completed will provide the latter and, at a moderate cost, place in the hands of every one who makes any pretense to knowledge of systematic botany, within the limits here treated, the means of doing for himself, in a large measure that which he has heretofore felt compelled to have done for him by the specialist.

In the sequence of families and genera the authors have followed closely the plan of Engler and Prantl in their "Natürliche Pflanzenfamilien" in accordance with present knowledge of relationship. They have also in following the spirit of rules adopted by both European and American botanists for securing greater stability in nomenclature, changed the names of many genera and species. These changes will doubtless cause some temporary inconvenience, but if in this way order shall succeed chaos, none will regret the inconveniences.

Condensed keys to the genera and species add greatly to the usefulness of the work. A key to the families would make it possible to dispense with the older manuals where this is desirable. In addition to the concise description of the species each is illustrated. The illustrations consist of representations of the entire plant or a considerable portion of it, reduced to from ⅓ to ⅘ natural size, and generally the floral organs considerably magnified.

The use of the duodecimal system of measurement in a scientific work in the very close of the nineteenth century should receive the disapproval of all. The mechanical work on the volume issued is good in every respect. The second and third volumes are ready for the printer and will appear as rapidly as the work of printing will allow.

L. S. Cheney.

Naturwissenschaftliche Einführung in die Bakteriologie. Von Dr. Ferd. Hueppe, Professor der Hygiene an der deutschen Universität zu Prag. Ein Bd., pp. VI, 268. Mit 28 Holzschnitten im Texte. C. W. Kreidel's Verlag, Wiesbaden. 1895. M. 6.00.

Bacteriology, as one of the most recent branches of biological science, has made such rapid progress in the last ten or twenty years that it is considered by many as the climax of modern scientific attainment. To be told that bacteriology during all these years has occupied an inferior position judged from a truly scientific standpoint, that it was almost exclusively a descriptive science and that it is at present in a stage of transition from a descriptive to an exact science, no doubt is a surprise to many. It is true that in several departments of investigation bacteriologists have gone beyond the merely descriptive standpoint, but in most of these instances bacteriology was made subservient either to medicine or dairying. An exposition of bacteriology as an exact science from a purely biological standpoint had thus far not been attempted. To have written such a work in a broad philosophic spirit reflects great credit upon the author. The work is most timely and suggestive.

As an introduction into the scientific study of bacteriology it is evidently not intended for elementary bacteriological students. Bacteriological technique is entirely omitted and the chapter on Forms of bacteria is entirely general and comprises only thirty-two pages. Besides the numerous treatises on descriptive bacteriology the author himself has written a work on Die Formen der

Bakterien und ihre Beziehungen zu den Gattungen und Arten. On the other hand the book is not merely written for advanced students in bacteriology, but for the student of biology and chemistry, indeed for the general reader of modern science.

The absence of descriptive detail and the philosophic thread running through the various chapters make these not only interesting reading, but at times truly fascinating. That many of the views expressed must be taken with a grain of allowance and even skepticism, must be expected in a first attempt of this kind. It occurs and even occurs frequently in much older sciences that the views of two investigators of high standing are diametrically opposed to each other. To discuss the views presented, therefore, cannot fall within the proper scope of a book review. The fact that the views respecting the form and life function of the bacteria are undergoing rapid changes, is sufficient reason to refrain from a discussion of details. The principal value of the book, aside from being the first general treatise of its kind, lies in its suggestivenes. The exactness of many of the deductions based on comparatively few experiments may often be questioned. Yet this condition is preferable by far to one of dogmatism based on a series of one-sided experiments and a large dose of ignorance. If the views suggested are false they can be combatted, but a negation will often necessitate experimentation along new lines and thus prove of great benefit to the science. To find fault with still doubtful views would, therefore, in this case imply smallness on the part of the critic. Suggestiveness is, in fact, one of the strongest features of the work.

On the other hand, the reader cannot help being impressed with the critical vein running through most of the chapters and with the fact that it sometimes betrays a somewhat hypercritical and sensitive spot. To a person outside of bacteriological controversy the views attributed to others at times appear exaggerated at least. Bacteriology is still in a stage of development in which the formation of schools comes natural to men. Far from underestimating the value of one school in breaking down dogmatic views of another it must be generally conceded that the opposing school is sometimes as one-sided as the school opposed. Contributions from such schools are apt to assume the form of a debate, rather than of a many sided, well rounded discourse. As the science of bacteriology advances, this tendency, no doubt, will be outgrown more and more.

Finally it should be mentioned that the book is dedicated to the Militärärztliche Bildungsanstalt of Berlin in the year of the hundreth anniversary of its foundation and that this institution has produced such men as Helmholtz, Virchow, Behring, Loeffler and the author of this treatise.

E. K.

Grundriss der Physik. By Dr. Walter Guttmann. pp. 128. George Thieme, Leipzig. 1896.

Within the small space of 128 pages, Dr. Walter Guttmann has condensed an outline of the entire subject of physics. If this book were intended as a compendium of the subject, or even as a book upon which the student were to depend for his sole guidance in this science, its deficiencies would be most lamentable. The author, however, guards against criticism in this direction by saying in the preface that he intends to give merely an outline or synopsis of the subject, and designs this only for chemists and pharmacists, and others who desire to take only a minor study in physics. Considered in the light of the author's purpose in writing the book, this little work fulfills its purpose well. The various principles of physics are brought out in a clear and forcible manner, although they are briefly treated, and long mathematical discussions are omitted. The subject is brought down to date, for a short chapter is added on the Roentgen rays, and in many places the reader is surprised at the detail which has been employed in so brief a treatise, as for instance, in the discussion of the cardinal points of a lens. The book, however, could hardly be used as a text, and probably would be found most useful if used as an extended syllabus to a good course of experimental lectures. *Benjamin W. Snow.*

An Illustrated Dictionary of Medicine, Biology and Allied Sciences, including the pronunciation, accentuation, derivation, and definition of the terms used in medicine, anatomy, surgery, obstetrics, gynecology, therapeutics, materia medica, pathology, dermatology, pediatrics, ophthalmology, otology, laryngology, physiology, neurology, histology, toxicology, dietetics, legal medicine, psychology, climatology, etc., etc., and the various sciences closely related to medicine, bacteriology, parasitology, microscopy, botany, zoology, dentistry, pharmacy, chemistry, hygiene, electricity, veterinary medicine, etc. By George M. Gould, A. M., M. D. Third edition, revised. One vol., pp. XVI, 1633, with tables and illustrations. P. Blakiston, Son & Co., Philadelphia. 1896.

Dr. Gould's experiences as author of The Student's Medical Dictionary and as editor of The Medical News seem to have especially fitted him for the planning and execution of a work that might well be called the "medical Webster." The practical success of the result as expressed by the appearance of three editions within a year and a half seem to fully warrant the above statement. That such a bibliographic production is not the work of one man may readily be surmised from the array of subjects enumerated on the title page. Medicine alone has been specialized to an extreme extent, but if biology, chemistry and a host of other more or less related sciences are included within the scope of a dictionary, one is inclined rather to regret that the number of colaborers was not even larger.

The prime object, as far as selection of words is concerned, was not only to include an epitomization of the works of older lexicographers, but to include the thousands of new terms that have been coined in recent years by a host of active specialists in all departments, and which were scattered through almost countless medical treatises and periodicals. The stress that is laid on the relation of biology to medicine, the former being considered as the foundation of the latter, and the inclusion of numerous biological terms help to emphasize the truely modern scientific conception of the work.

The book is not a dictionary pure and simple, but it is encyclopædic in character. This accounts for the descriptive paragraphs, which are not infrequent, for lengthy tables and illustrations not only within the text, but at times occupying a whole page or even more.

To criticize in detail a work that is the product of a number of specialists certainly does not lie in the province of an individual. As to chemical definitions, however, the writer may be permitted to express the regret that a science that has been specialized to an equal degree with medicine, should not have received more attention at the hand of chemists. Chemistry should receive equal recognition with biology in the study of medicine.

As to the general appearance of the book, it must be pronounced excellent. Without the waste of space the columns are compact, but do not at all appear crowded. The judicious use of heavy faced type for primes and subprimes, and of italics for the phonetic pronunciation, references, etc. facilitates rapid orientation. The type is clean cut and the press-work is good, considerations of great importance in a reference work to be used as freely as a dictionary. The work is a credit to both author and publishers and will prove a valuable addition to a general scientific and pharmaceutical as well as medical library. *E. K.*

Entwickelung und Bedeutung der Zahl und des Masses. Reinhold Patitz. Selbstverlag. 1896. pp. VI, 208.

This little work professedly written in the interest of the adoption in the United States of the metric system of weights and measures is rather to be regarded as a series of sketches illustrating the growth of astronomy from the earliest historic period to the present time, supplemented by a considerable amount of interesting material relating to contemporary astronomers.

Opinions will always differ as to what should be included and what excluded from a work of this kind and the author's sins in this respect are probable no greater than those of many another, although in places considerable editorial pruning would seem to be requisite to remove from the biographical matter a strong autobiographical smack. Upon the whole Mr. Patitz has given us an agreeable mélange in which some things not easily accessible elsewhere are mixed with much that is common property.

George C. Comstock.

Grundriss einer Geschichte der Naturwissenschaften. Zugleich eine Einführung in das Studium der naturwissenschaftlichen Litteratur. Von Dr. Friedrich Dannemann. 1. Band: Erläuterte Abschnitte aus den Werken hervorragender Naturforscher. Ein Bd., pp. XII, 375, mit 44 Abbildungen in Wiedergabe nach den Originalwerken. Verlag von Wilhelm Engelmann, Leipzig. 1896. M. 6, gebdn. M. 7.20.

The ever increasing interest revealed for the history of science and the sciences as we approach the close of this century is highly gratifying. The growth of the natural sciences during the present century has been so phenomenal, what might be termed their "material development" has been so great that the higher interests frequently have been lost sight of. In chemistry the productiveness of the benzene theory and its congeners has resulted in such a rapid accumulation of new facts that chemists seem to have been oblivious of the almost chaotic condition that characterizes many of our text- and reference books in which these facts are recorded. Chemical philosophy as well as history were equally ignored. The chemist felt justified in rediculing the speculative philosopher who talked nonsense about chemical phenomena of which he knew absolutely nothing. The consequence was a skepticism toward all philosophic tendencies. In the pride of his accomplishments the chemist also ridiculed the alchemist, the iatrochemist and the disciple of the philogistic school. He failed to realize that there is a thread connecting the present age with the very dawn of chemistry.

Fortunately there have always been exceptions to this rule. It is equally fortunate that the exception of this century now stands a good show of becoming the rule of the next. The "Probierkünstler" and the "chemische Küche" have radically changed. It is now universally recognized that a disciplinary value of no mean order must be accorded to a rational study of chemistry. That as a cultural study it should not receive the same universal recognition is largely due to the extended technical application which chemistry has found, but in part also to chemists themselves, who have ignored the philosophical and historical aspects of their science. Not many years ago the historical lecture in sciences at German universities was the exception, to-day a chemical institute can hardly be considered as doing its duty without at least one historical course of lectures.

What has been said about chemistry applies to the other sciences: to some less, to some even more. The university student, as a rule, has access not only to historical treatices on the various sciences, but to original articles of historic value and more or less to older literature in general. In recent years reprints of the classics with notes are published for more convenient and intelligent use. Nothing will do more to foster the historic spirit than the familiarity with original articles. To make such a familiarity easy, to a limited extent it is true, but sufficiently to create a desire for a more general and comprehensive understanding of the subject is the object and merit of the first volume of the "Grundriss" before us. The sixty-two selections from classics in physics, chemistry, botany, zoology, astronomy, physiology, geology and anthropology with the brief biographical sketches of their authors and short foot-notes will serve as an admirable introduction into the history of science in general. Though the book will be valuable to the university student who has given but little attention to the study of the history of science, it ought to find a place in the colleges and even preparatory schools; for the study of the history of science like the study of general history should begin as early as possible. The monographic treatment with biographical sketches makes it specially adapted to the use of beginners in the study of science.

Whether it is unwarranted optimism to hope for such an innovation in a country where at present a twelve weeks' normal course in physics, chemistry or botany is often considered sufficient preparation to teach these sciences in high-schools the future alone will demonstrate. Let us hope the English language will soon possess a like work which may aid in paving the way for a more extended study of the history of the natural sciences. *E. K.*

SUPPLEMENT, APRIL 1896.

American Pharmaceutical Association.

Section on Education and Legislation.

Fourty-fourth Annual Meeting at Montreal, P. Q., Canada, August 12th to 18th, 1896.

The officers of this section solicit papers upon any subject pertaining to pharmaceutical education and legislation. As topics of interest the followihg are suggested:

1. What has been the effect of pharmacy legislation upon the practice of pharmacy in the United States?

2. What is the best form of law for regulating the labeling and sale of poisons?

3. Should a pharmacy law provide for one or for two grades of licentiates?

4. What is the best method of bringing about greater uniformity in pharmacy legislation in the different states?

5. Is the sale of intoxicating liquor in a drug store strictly for medicinal purposes a necessity, or would it be wise to prohibit the sale excepting in compounds absolutely?

6. What is the best method of conducting examinations under existing laws, and in view of the circumstances under which the boards are required to work?

7. To what extent, under existing circumstances, can the work of examining boards be made more practical?

8. To what extent should a candidate for registration in pharmacy be required to be familiar with the working formulas of official preparations?

9. To what extent should a candidate for registration in pharmacy be required to be familiar with the subjects of microscopy and volumetric analysis?

10. To what extent should the physiological properties and therapeutic action of drugs be taught as a part of a course in pharmaceutical materia medica?

11. What is the place of the "Quiz" in a course in pharmacy?

Papers upon any other topic appropriate to this section will be welcomed. Papers should be in the hands of the committee not later than June 1st, 1896.

Carl S. N. Hallberg, Chairman,
358 Dearborn St., Chicago, Ills.
Jas. H. Beal, Secretary,
Scio, Ohio.

Section on Scientific Papers.

QUERIES.

1. **Sanguinaria.** The liquid preparations slowly deposit a precipitate upon the sides of the containers. Can a menstruum be devised which will hold permanently in solution the soluble constituents?

2. **Gelatine Capsules.** What general rule should be adopted in compounding prescriptions ordering gelatin capsules? When should the ingredients be dispensed in dry powder, and when is it preferable to form them into a mass?

3. **Ichthyol.** Ichthyol is now being used internally, dissolved in water and other media. A palatable form of administration is wanted.

4. **Salol and Acetanilid** are given usually in powder form. Cannot formulas for therapeutically unobjectionable liquid preparations of the same be devised?

5. **Salicylic Acid.** It has been alleged that the synthetical salicylic acid now in the market occasionally shows the presence of salol. Is this statement correct, and if so, to what extent?

6. **Formalin.** A 40 percent solution of formaldehyde under that name is attracting much attention as an antiseptic and deodorizer. A good practical formula for its preparation by the retail pharmacists is wanted.

7. **Kamala.** It is supposed that rosin is the active constituent. Investigation recommended. Is a tincture advisable?

8. **Pyrethrum Carneum.**
" **Roseum.**
" **Cinerariaefolium** } Insect Powder. Can it not be used as a medicine? On what depend their insecticide properties?

9. **Veronica Officinalis** is used largely as a house remedy for pectoral complaints and skin diseases. Is there any alkaloid or active principle in the plant to warrant such use?

10. **Viscum Album (Mistletoe)** is used by practicioners to arrest post-partum and other uterine hemorrhages. Investigation invited.

11. **Pichurim Beans.** What are they? Various descriptions of their oils are given by different investigators.

12. **Strophanthus Seeds.** A determination of the active principles in the seeds of commerce, their nature, quantity, and method of valuation.

13. **Pareira.** Pareira is a valuable diuretic and tonic drug. Buxine has been found in it, but this can hardly be the important principle. What is it?

14. **Rhus.** What is the really potent principle of the Rhus group? Is it a volatile acid as claimed by Maisch, or is it a substance resembling Cardol?

15. **Tannin.** At what season of the year should the tannin drugs be gathered? What relation does the amount of tannin present bear to that of starch? Does the tannin increase as the starch decreases? Or, is this true of some drugs but not of others?

16. **Cypripedium.** There appears to be a poisonous principle, producing effects similar to those of *Rhus Toxicodendron*, in the glandular hairs of some Cypripediums, particularly *C. Spectabile.* What is this principle?

17. **Iris.** The rhizomes of many species of Iris abound in starch, as the species that furnish the orris root of commerce, but the rhizomes of *Iris Versicolor* and of the *Iris pseudo-acorus* do not turn blue with iodine solution. What is the carbonhydrate present?

18. **Veratrum.** By what means may the rhizomes of *Veratrum Album* best be distinguished form those of *Veratrum Viride?* Some method is desirable by means of which this may be done easily and with certainty.

19. **Aconites.** The different aconites are very liable to be confounded. In the case of drugs so potent it is exceedingly important that the structure of each species liable to be gathered or sold for the officinal should be carefully described. Someone should untertake the task of the thorough investigation of the microscopical structure of all the species.

20. **Pepsin Test.** A discussion of the variable results obtained in the tests.

21. **Cotton-Seed Oil.** A review of the tests for its presence as an adulterant in other fixed oils.

22. **Cod-Liver Oil.** Are the official tests sufficient to distinguish a pure cod-liver oil? If not, what additional ones should be adopted?

23. **Methyl Acetate.** Write a paper on the possible use of methyl acetate as a solvent in pharmacy.

24. **Sodium Bisulphite.** The sodium bisulphite of commerce is rarely found more than one-fourth the strength required by the U. S. Pharmacopœia. Is the official standard too high, or does this salt rapidly deteriorate on keeping?

25. **Terpeneless Volatile Oils** are now articles of commerce. Are they liable to deteriorate on keeping? How much stronger are they than ordinary volatile oils?

26. **Lard Oil.** Lard oil appears to be grossly adulterated. Is it possible to obtain lard oil in the open market of the standard of purity of the U. S. Pharmacopœia?

27. **Guaiacol.** Commercial guaiacol varies in purity from 50 to 90 percent according to Dr. Squibb. Cannot some process be devised for its assay and purification, if necessary?

Committee on Scientific Papers:
Samuel P. Sadler, Ph. D., Chairman,
Philadelphia, Pa.
William C. Alpers, Secretary,
Bayonne, N. J.
Lucius E. Sayre, Associate,
Lawrence, Kan.

Missouri Pharmaceutical Association.

Committees and Delegates for 1895—6.

President J. M. Love of Kansas City announces the following:—

Membership.—Oscar H. Ott, chairman, Sedalia, Missouri; Fred. Reicht, Meyer Brothers Drug Company, St. Louis; Wm. Berryman, Sweet Springs; H. T. McArthur, Chillicothe; A. S. Forker, Kansas City; C. A. Hinton, Springfield; Frank Mittong, Moffit-West Drug Company, St. Louis.

Papers and Queries.—C. E. Corcoran, chairman, Kansas City; A. N. Doerschuk, Kansas City; J. M. Good, St. Louis; A. J. Boaz, Springfield; E. Soper, St. Joseph.

Legislation.—A. Maupin, chairman, Pattonsburg; A. Brandenberger, Jefferson City; C. C. Davidson, Eldorado Springs; Geo. E. Kimball, Kansas City; Otto Claus, St. Louis.

Drug Adulteration. — Professor Francis Hemm, chairman, St. Louis.

Subcommittees. — 1. Pharmaceutical: G. H. Chas. Klie, M. D., Ph. G., St. Louis; A. Brandenberger, Ph. G., Jefferson City; A. N. Doerschuk, Kansas City.

2. Chemical: Wm. K. Ilhardt, Ph. G., Ph. C., St. Louis; G. H. Chas. Klie, M. D., Ph. G., St. Louis; Chas. Houser, Ph. D., Flat River.

3. Microscopical: H. M. Whelpley, M. D., Ph. G., St. Louis; J. C. Falk, M. D., Ph. G., St. Louis; Wm. K. Ilhardt, Ph. G., Ph. C., St. Louis.

Trade Interests. — Mr. F. A. Faxon, chairman, Kansas City; Mr. Gustave G. Meyer, St. Louis; Hon. C. P. Walbridge, St. Louis; Mr. M. H. Evans, St. Louis; Mr. J. P. Raymond, Kansas City.

Microscopy.—Dr. F. L. James, chairman, St. Louis; Dr. C. C. Hamilton, Kansas City; Dr. H. M. Whelpley, St. Louis; Mr. W. E. Bard, Sedalia; Mr. W. A. Hume, Columbia.

Entertainment. — F. W. Sihler, chairman; W. P. Hucke, Kansas City; A. Breunert, Kansas City; J. Griffiths, Kansas City; F. R. Scharlach, St. Louis; W. C. Off, St. Louis; A. S. Forker, Kansas City; Ed. G. Orear, Breckenridge; Geo. L. Parsons, Kansas City; Geo. Eyssell, Kansas City; O. B. Dickinson, Kansas City; J. H. Barnes, Liberty; W. C. Johnson, St. Louis; Ferd. L. Crampton, Kansas City; Geo. F. Berry, Kansas City; J. C. Simmons, Liberty; W. D. Hussung, St. Louis; G. P. Hardesty, Kansas City; W. E. King, Kansas City; W. M. Federmann, Kansas City; Paul L. Hess, Kansas City; J. W. Hackett, Kansas City.

Pharmacopoeia.—Wm. Mittelbach, Boonville; W. M. Federmann, Kansas City; Frank Garthoffner, St. Louis; J. F. Boaz, Springfield; W. A. Shelton, Marceline.

National Formulary.—Dr. H. M. Whelpley, St. Louis; Wm. Mittelbach, Boonville; Paul L. Hess, Kansas City; Prof. David Walker, Kansas City; A. H. Koch, St. Louis.

Attendance.—A. S. Forker, chairman, Kansas City; Geo. E. Hopkins, St. Louis; A. H. Coffer, Carthage; R. H. Swinney, Ashgrove; B. M. Bennett, Pierce City.

Transportation.—G. L. Parsons, Kansas City; J. F. Boaz, Springfield, Illinois; H. C. Servant, Sedalia; W. C. Johnson, St. Louis; E. Soper, St. Joseph.

Exhibits.—G. W. Clinton, chairman, Independence; C. L. Cravens, Excelsior Springs; Fred. L. Striblen, St. Joseph; J. H. Simms, Kansas City; Jas. L. Mitchell, Stockton.

Deceased Members.—R. N. Williams, Cameron; Chas. W. Hutchason, Higginsville; E. Brinkmann, St. Louis; G. W. Cunningham, Brunswick; E. W. Patton, Richmond.

Nationaal Legislation.—A. Brandenberger, chairman, Jefferson City; Paul L. Hess, Kansas City; J. M. Good, St. Louis; F. W. Sennewald, St. Louis; H. C. Arnold, Kansas City.

Member American Pharmaceutical Association National Committee on Trade Interest and Local Organization for Missouri.—Mm. Mittelbach, Boonville.

Delegates.

American Pharmaceutical Association.—Wm. Mittelbach, Boonville; A. Brandenberger, Jefferson City; H. M. Whelpley, St. Louis; C. E. Corcoran, Kansas City; E. S. Lawbough, St. Mary.

Alternates.—Francis Hemm, St. Louis; A. N. Doerschuck, Kansas City; M. W. Alexander, St. Louis; Emile Breunert, Kansas City.

Illinois Pharmaceutical Association.—A. Brandenberger, Jefferson City; J. M. Good, St. Louis; Dr. H. M. Whelpley, St. Louis.

Arkansas Pharmaceutical Association.—Dr. H. M. Whelpley, St. Louis; Dr. F. L. James, St. Louis.

Kansas Pharmaceutical Association.—J. Griffiths, Kansas City; R. T. Thornton, Kansas City; Mrs. Lottie M. McVey, Kansas City; E. Soper, St. Joseph.

Alternates. — G. W. Clinton, Independence; A. Kansas City; S. A. Howard, Kansas City.

Calendar of State Pharmaceutical Associations.

Name.	Date.	Place.	Secretary.
Oklahoma	April 7	OklahomaC'y	E. DeBarr, Norman.
Florida	May —	Jacksonville	W. M. Stewart, Palatka.
Maryland	May —	Baltimore	J. H. Hancock, Baltimore.
Massachusetts	May —	....	J. F. Guerin, Worcester.
Georgia	May 5	Atlanta	H. H. Arrington, Summerville.
Delaware	May 7	Dover	F. W. Fenn, Wilmington.
Alabama	May 12	Opelika	P. C. Candidus, Mobile.
California	May 12	San Francisco	D. D. Hunt, San Francisco.
Louisiana	May 12	New Orleans	J. A. Legendre, New Orleans.
Texas	May 12	Dallas	R. H. Walker, Gonzales.

Readers of the Review have inquired whether and when copies of Prof. J. U. Lloyd's Etidorhpa were to be had. The first or Author's edition of 1299 copies were subscribed for before the day of publication. The second edition of 1020 copies were sold in less than a week. The publishers, The Rob. Clarke Co., of Cincinnati have announced that a large third edition is now prepared.

Calendar of Boards of Pharmacy.

State and Territory.	Place of Next Meeting.	Date of Next Meeting.	Name and Address of Secretary.
Iowa	....	April 7	S. J. Spaulding, Des Moines.
Mississippi	Jackson	April 7	J. C. Means, Natchez.
Montana	Butte	April 7	G. W. Shoemaker, Billings.
Oklahoma	OklahomaC'y	April 7	C. P. Wickmiller, Kingfisher.
California	San Francisco	April 8	John H. Dawson, San Francisco.
Maine	Bangor	April 8	FrankP.Partridge, Augusta.
South Dakota	Huron	April 8	I. A. Keith, Lake Preston.
Dist. of Columbia	Washington	April 13	R. L. Lynch.
Nebraska	Omaha	May 13	Griff. J. Evans, Hastings.
Missouri	Kansas City	April 13	F. W. Sennewald, St. Louis.
Illinois	Chicago	April 14	Frank Fleury, Springfield.
Maryland	Baltimore	April 14	J. F. Hancock, Baltimore.
Pennsylvania	Pittsburg	April 15	C. T. George, Harrisburg.
Tennessee	Nashville	April 15	J. O. Burge, Nashville.
Wisconsin	Waupaca	April 15	E. B. Heimstreet, Janesville.
New Jersey	Trenton	April 16	A. S. Elwell, Bridgeton.
Minnesota	Madison	April 21	H. G. Webster, Minneapolis.

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- **Lebeuf's Coal Tar.**
- **Mathey Caylus's Capsules.**
- **Midy's Capsules of Santal.**
- **Nourry's Iodinated Wine.**
- **(Paraf Javal) Preparations of Strontium.**
- **Rabuteau's Pills, Elixir and Syrup.**
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SUPPLEMENT, MAY 1896.

Universities and Colleges.

Chicago College of Pharmacy.

The announcement is made that the Trustees of the State University of Illinois have accepted the Chicago College of Pharmacy as a department.

Philadelphia College of Pharmacy.

The Philadelphia College of Pharmacy celebrated its seventy-fifth anniversary by giving a supper in the College Museum on Wednesday evening, April 22.

Pittsburg College of Pharmacy.

Commencement evercises were held Friday evening, April 17, at Carnegie Library. The senior class consisted of thirty-five members.

Woman Ph. D.'s at German Universities.

The courtesy with which Americans and others are treated at German Universities is generally known. Thus it has come about that American and English women were admitted to the lecture rooms of German professors and even to examinations when German women were excluded. This has led the German women to use all their energy in order to receive for themselves the advantages of a German university education. That they are successful is again demonstrated by the fact that recently two women have taken the doctor's degree in the philosophical faculties of two universities: Miss Anna Gerber of Berlin at the University of Heidelberg, and Countess Marie von Linden at Tuebingen. The dissertation of the former was on the "Einfluss der Königin Kunigunde auf die Politik Heinrich's II"; that of the latter "Ueber die Entwicklung der Structur und der Zeichnung der Gehäuseschnecken des Meeres".

Botany at the University of Chicago.

The recent "Culver gift" of one million dollars to the University of Chicago for biological endowment has resulted in the establishment of a Department of Botany, in which Dr. John M. Coulter, for several years President of Lake Forest University, has accepted the head professorship. A large building, to be known as the "Hull Botanical Laboratory," has been planned, and its erection will soon be begun. The four stories of this building will contain ample space for lecture rooms, libraries, laboratories, and private research rooms for morphology, physiology, and taxonomy. Above the fourth story a large roof greenhouse will supply an abundance of living material under all conditions. As the building will not be completed before April of 1897, the full botanical staff will not be organized before the fall of that year.

As a result of the establishment of this department, the Botanical Gazette, the foremost botanical journal of America, edited by Professors J. M. Coulter, C. R. Barnes (University of Wisconsin) and J. C. Arthur (Purdue University) passes into the possession of the University of Chicago. The establishment of a Department of Botany, and the appointment of the senior editor as head professor, justifies the University of Chicago in assuming the financial responsibility for the publication of the Gazette, which has been brought to its present standing by private enterprise. That this has been possible demonstrates its adaptation to the needs of American botanists, as well as their cordial appreciation. Now that it is about to enter upon a period of strong financial support it expects to meet these needs in the fullest possible way, and more abundantly deserve the good will of its readers.

With this change the Gazette, however, does not become the organ of the Department of Botany of the University of Chicago or of any other university. The only change that will become apparent to its readers will come from the much larger opportunity of serving botany, for the same editors will remain in charge, and the general purpose of the journal will continue to be the same. Its relation to the University of Chicago is to bring it that permanence and possibility of development which the present condition of botanical science demands.

University of Vienna.

During the past semester 7012 students, regular and irregular, were enrolled at the University of Vienna. Of the 4643 regular students 2211 belonged to the law, 1727 to the medical, 528 to the philosophical and 177 to the theological faculty. Of the 2369 irregular students 1463 belonged to the medical faculty (of these 196 were Americans and 124 Russians), 557 belonged to the law, 340 to the philosophical faculty (incl. 70 pharmaceutical students), and 9 were theologians. The percentage of pharmaceutical students to the total enrollment, therefore, is slightly less than one percent.

University of Wisconsin.

The School of Pharmacy of the University of Wisconsin has recently received a number of valuable contributions to its collections and laboratories. Messrs. Gilpin, Langdon & Co., of Baltimore, donated an extensive collection of drugs, which constitute an important addition to the pharmacognostical cabinet. A collection of ninety specimens, many old and unusual ones, was contributed by Dr. Fr. Hoffmann, who, several years ago, donated a handsome collection of cinchona barks of historical interest to this cabinet. An interesting contribution has been received from Mr. E. B. Heimstreet, secretary of the State Board, consisting of a string of French issue peas; upon examination, they proved to be immature orange fruits turned into small spheres. Two beautiful specimens of kino were received from Baron Ferd. v. Mueller, Melbourne, Australia. Messrs. Fritzsche Bros., of New York, who have repeatedly demonstrated their liberality to the Wisconsin School, have supplied the pharmaceutical chemical laboratory with specimens of volatile oil for research work. The laboratory for practical pharmacy has just received a set of apparatus for the preparation of medicinal wafers from Messrs. Utard & Co., New York. A large number of pamphlets and journals have been added to the department library during the past few months. Steps are now being taken to have a considerable number of volumes bound.

Scientific Societies.

American Pharmaceutical Association.

President J. M. Good has announced the following members of the Special Auxiliary Committee on Membership. Each member has charge of the work of obtaining applications in his own state. If you desire to join the association apply to your state representative on the committee.

Alabama—E. P. Galt, Selma.
Arizona—Clemens L. Eschman, Phœnix.
Arkansas—W. W. Kerr, Russellville.
California—W. M. Searby, San Francisco.
Canada, Province Ontario—John Lowden, Toronto.
Canada, Province Quebec—G. Lachance, Montreal.
Colorado—Chas. S. Kline, Denver, Nineteenth and Welton streets.
Connecticut—Chas. A. Rapelye, Hartford.
Delaware—John M. Harvey, Wilmington.
District of Columbia—Saml. L. Hilton, Washington.
Florida—Wm. A. Dell, Jacksonville.
Georgia—Henry R. Slack, La Grange.
Idaho—A. O. Ingalls, Murray, Shoshone Company.
Illinois—H. H. Rogers, Kankakee.
Indiana—F. H. Carter, Indianapolis.
Indian Territory—Chas. G. Moore, Eufaula.
Iowa—W. H. Torbert, Dubuque.
Kansas—Mrs. M. O. Miner, Hiawatha.
Kentucky—Addison Dimmitt, Louisville.
Louisiana—L. F. Chalin, New Orleans.
Maine—Edw. A. Hay, Portland.
Maryland—D. M. R. Culbreth, Baltimore.
Massachusetts—F. M. Harris, Worcester.
Michigan—A. S. Parker, Detroit.
Minnesota—Fred. J. Wulling, Minneapolis.
Mississippi—J. C. Means, Natchez.
Missouri—Ambrose Mueller, St. Louis.
Nebraska—A. V. Pease, Fairbury.
Nevada—W. A. Perkins, Virginia City.
New Hampshire—A. C. Preston, Portsmouth.
New Jersey—Geo. W. Parisen, Perth Amboy.
New Mexico—Jas. O. Kinnear, Deming.
New York—C. A. Mayo, New York.
North Carolina—E. V. Zoeller, Tarboro.
North Dakota—H. L. Haussamen, Grafton.
Nova Scotia, New Brunswick and Prince Edward's Island—F. C. Simson, Halifax.
Ohio—Louis C. Hopp, Cleveland, 198 Euclid avenue.
Oklahoma Territory—John E. Sombart, El Reno.
Oregon—Geo. C. Blakely, The Dalles.
Pennsylvania—Wm. McIntyre, 2429 Frankfort ave., Philadelphia.
Rhode Island—Wm. O. Blanding, Providence.
South Carolina—Oscar E. Thomas, Columbia.
South Dakota—I. H. Keith, Lake Preston.
Tennessee—J. O. Burge, Nashville, Broad and Market streets.
Texas—Thomas R. Keene, Dallas.
Utah—Frank A. Druehl, Salt Lake City, Main & Third South street.
Vermont—H. A. Chapin, Brattleboro.
Virginia—John F. Christian, Roanoke.
Washington—Henry E. Holmes, Seattle.
West Virginia—E. L. Boggs, Charleston.
Wisconsin—John R. Drake, Milwaukee.
Wyoming—Dr. Thomas G. Magee, Rawlins.

The Council Committee consists of Dr. H. M. Whelpley (chairman), St. Louis, Missouri; Chas. M. Ford, Denver, Colorado; Geo. W. Voss, Cleveland, Ohio; S. P. Walton, Atlanta, Georgia; Jacob Burgheim, Houston, Texas; and Geo. W. Kennedy (secretary), Pottsville, Pennsylvania.

Calendar of State Pharmaceutical Associations.

Name.	Date.	Place.	Secretary.
Georgia	May 5	Atlanta	H. H. Arrington, Summerville.
Delaware	May 7	Dover	F. W. Fenn, Wilmington.
Alabama	May 12	Ophelika	P. C. Candidus, Mobile.
Arkansas	May 12	Little Rock	J. F. Dowdy, Little Rock.
California	May 12	San Francisco	G. J. Harvey, San Francisco.
Florida	May 12	Jacksonville	W. M. Stewart, Palatka.
Louisiana	May 12	New Orleans	J. A. Legendre, New Orleans.
Texas	May 19	Dallas	R. H. Walker, Gonzales.
Indian Territory	May 20	Wagoner	S. S. Moore, Vinita.
South Carolina	May 21	Charleston	J. A. Barbot, Charleston.
Kansas	May 26	Fort Scott	Mrs. M. O. Miner, Hiawatha.
New Jersey	May 27	Lakewood	W. C. Alpers, Bayonne.

Minnesota State Pharmaceutical Association.

The twelfth annual meeting of the Minnesota State Pharmaceutical Association will be held at the Lake Park Hotel, Lake Minnetonka, June 16, 17 and 18. Prof. A. B. Prescott, Dean of the Michigan University, School of Pharmacy, will be present and deliver an address.

German Chemical Society.

Inasmuch as Prof. F. Beilstein does not contemplate a further revision of his well-known *Handbuch der organischen Chemie*, the German Chemical Society has determined to edit and publish further editions of this valuable reference work.

The society, furthermore, contemplates the printing of original articles only in its proceedings and to purchase the Chemisches Centralblatt for the purpose of publishing chemical abstracts more completely than before. Such a concentration of energy will certainly be greeted with pleasure everywhere in chemical circles, especially since a considerable reduction in price of the Centralblatt may be expected.

Medical Meetings at Atlanta.

Besides the American Medical Association several other medical organizations will hold their annual meetings at Atlanta early this month.

The Association of American Medical Colleges will meet May 4, under the presidency of Dr. Wm. Osler of Baltimore.

Among the papers of pharmaceutical interest to be read at the meeting of the American Academy of Medicine those on "The confusion of pharmacy relating to the theory and practice of medicine" by Dr. Elmer Lee of Chicago," and on "The preparatory mental discipline for medical students" by Dr. F. H. Gemite of Portland, Me., may be mentioned.

Calendar of Boards of Pharmacy.

State and Territory.	Place of Next Meeting.	Date of Next Meeting.	Name and Address of Secretary.
Alabama	Ophelika	May 14	E. P. Galt, Selma.
Arkansas	Little Rock	May 12	W. W. Kerr, Russellville.
Florida	Jacksonville	May 11	Th. Clarke, Jacksonville.
Georgia	Atlanta	May 4	Dr. H. R. Slack, La Grange.
Kansas	Fort Scott	May 28	W. C Johnston, Manhattan.
Massachusetts	Baton	May 5	F. H. Butler, Lowell.
Nebraska	Omaha	May 13	G. J. Evans, Hastings.
North Carolina	Raleigh	May 5	W. Simpson, Raleigh.
Ohio	Columbus	May 12	W. R. Ogier, Columbus.
Rhode Island	Providence	May 4	W. E. Cates, Providence.
West Virginia	Wheeling	May 6	H. F. Pfost, Jackson

Georgia State Board.

Of the sixteen applicants examined March 24th at Atlanta, Ga., four received the certificate of pharmacists, four as apothecaries, one was licensed as druggist, and eight failed.

Pharmacists: —

W. H. Butler, Montezuma, Ga., J. N. King, Rochelle Ga., J. R. Jackson, Social Circle, Ga., and W. O. Bray, Adairsville, Ga.

Apothecaries: —

J. H. Meek, Black Hawk, Miss., H. H. Sternbridge, Milledgeville, Ga., E. B. Jeiks, Quitman, Ga., and H. A. Dunwoody, Atlanta, Ga.

Druggist: — F. L. Lewis, Camilla, Ga.

Wisconsin State Board.

The April meeting of the Wisconsin State Board of Pharmacy was held at Wausau. Of the fortyseven candidates thirteen were granted licentiate certificates, sixteen assistant certificates, and eighteen failed.

Licentiates: —

G. E. Reinhart, Reesville; Emma M. Suets, Marinette; J. J. Ucke, Milwaukee; Dr. C. M. Skinner, Gladys C. Arey, Hartland; C. A. Barnett, Neenah; Charlotte Falk, Bayfield; M. J. McCoy, Waukesha; Gunther Bugge, Rice Lake; C. W. Jackson, Sheboygan Falls; C. A. Hoeschler, La Crosse; F. A. Loetz, Appleton; W. F. Lardner, Oconomowoc.

Assistants: —

F. E. Palmer, Sparta; E. C. Dettoff, Bloomer; F. W. Woelz, Green Bay; D. M. Lamreux, Seymour; O. Johnson, Eau Claire; P. E. Kabel, Plymouth; F. A. Mueller, Manitowoc; E. J. Hughes, Cambria; A. F. Dukerschein, Reesville; O. R. Briggs, Colby; M. Plank, Hancock; W. E. Porter, New London; A. F. Schroeder, Neenah; Fred J. Alter, Centralia; T. A. Clark, Manitowoc; H. A. Simond, Manitowoc.

Thursday afternoon the old board adjourned after extending a vote of thanks to the retiring member and president, Henry C. Schranck of Milwaukee. Thursday evening the new board met and David A. Taylor of Stevens Point presented his papers of appointment to succeed Henry C. Schranck. The following officers were elected for the ensuing year:

President C. R. Bechmann, Fountain City; secretary and treasurer, E. B. Heimstreet, Janesville. Meeting for examinations were fixed as follows: Wednesday, June 24, Madison; Friday, Aug. 14, Stevens Point; Wednesday Oct. 21, Ashland; Wednesday, Dec. 9, Milwaukee; Wednesday, Feb. 17, Milwaukee; Wednesday, April 12, La Crosse.

History and Biography.

Three Biographies.

Number twenty of the Berichte d. deutsch. chem. Gesellsch. for 1895 contains well-written biographical sketches with portraits of three chemists: Moritz Traube, Lothar Meyer and Hoppe-Seyler. Lothar Meyer* was professor of chemistry at the University of Tuebingen and Felix Hoppe-Seyler† professor of physiological chemistry at the University of Strassburg; Moritz Traube was a wine merchant, who was not only a successful business man but a fruitful experimentor and an authority on subjects of physiological chemistry.

Thomas Dover and John Keats.

In papers read before the Historical Club of the Johns Hopkins Hospital, Dr. William Osler presents interesting facts concerning two men whose names are well-known—Thomas Dover, whose fame has been perpetuated by the powder that he originated, and John Keats, the poet.

Dover was born in Warwickshire, England, about 1660, and received the degree of Bachelor of Medicine at Cambridge. In 1708 he was part owner and third in command of a privateering expedition against the Spaniards in the South Seas. This expedition was notable for its great financial success and for the discovery of Alexander Selkirk, the original of Robinson Crusoe.

After returning to England, Dover practiced in various places, and wrote a book, The Ancient Physicians Legacy, "designed for use in all private families," which is said to have produced a sensation in London. In this appears the recipe for the original Dover's powder, as follows:—"Take Opium one ounce, Salt-Petre and Tartar vitriolated each four ounces, Ipocacuana one ounce. Put the Salt-Petre and Tartar into a red hot mortar, stirring them with a spoon until they have done flaming. Then powder them very fine; after that slice in your opium, grind them to a powder, and then mix the other powders with these. Dose, from forty to sixty or seventy grains in a glass of white wine Posset going to bed; covering up warm and drinking a quart or three pints of the Posset. Drink while sweating." In reply to rivals who claimed that his dose was dangerously large he says: "I can produce undeniable proofs where a patient of mine has taken no less a quantity than one hundred grains, and yet has appeared abroad the next day." His specific in most cases was quicksilver, and he prescribed an ounce or an ounce and a quarter of crude mercury a day. He is said to have given one patient in five days within two ounces of two pounds of mercury.

The paper gives interesting glimpses of the state of English medicine and pharmacy early in the last century. Among the questionable means employed to work up a practice was "the insertion of cures by way of news in the daily papers." As the result of a regular business arrangement the apothecary recommended a physician, who was bound to return the favor by prescribing large quantities of medicine, whether it was needed or not. This practice is heartily condemned in Dover's book.

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* Pharm. Rundsch., 13, p. 119.

† Ibidem, p. 221.

Not all apothecaries may know that John Keats, the hundreth anniversary of whose birth was celebrated not long ago, was connected with their calling. When fifteen years of age he was apprenticed to a Mr. Hammond, surgeon, of Edmonton. Afterward he "walked" the hospitals of Guy's and St. Thomas, and in 1816 he passed the Apothecary's Hall. His tastes were not with this work, and he did not excel in it. In 1817 he abandoned the profession.

[Bul. J. H. Hospital, 8, pp. 1 and 11.]

Personals.

Mr. George S. Davis, publisher of the Index Medicus, which to some extent includes pharmaceutical topics, has been elected a foreign member of the Hygienic Society of Paris, in recognition of his services to medical literature.

Prof. Dunstan has resigned his position as Professor of Chemistry and Director of the Pharmaceutical Society in order to accept the appointment as Director of the Department of Scientific and Technical Research of the Imperial Institute.

Prof. Robert W. Bunsen, whose name is familiar even to the novice in the natural sciences, has celebrated his 85th birthday March 31st at Heidelberg, at which University he has been stationed since 1852.

The April number of the Bericht of Schimmel & Co. announces that Dr. F. B. Power, for four years director of the Garfield, N. J., laboratories, has resigned on account of private reasons. During this period Dr. Power has contributed largely to the chemical literature of volatile oils, not only exposing frauds but also adding valuable positive information. This number of the Review contains a very interesting article from his pen, presumably the last one that he will issue from the Garfield laboratory. The Bericht says of his leaving: "Seinem Wirken in unserem Hause wird ein dankbares Gedächtniss bewahrt bleiben." Whatever Dr. Power may do in the future we feel confident that his contributions to pharmaceutical literature will be equally valuable and welcome.

Bibliography.

The fourth edition of Prof. Lloyd's Etidorhpa has just appeared with The Robert Clarke Company of Cincinnati.

The new Graduate Handbook is announced by Leach, Shewell & Sanborn of Boston.

A collection of plant geographic monographs is announced by Wm. Engelmann of Leipzig. The first number, Grundzüge der Pflanzenverbreitung auf der iberischen Halbinsel, by M. Willkomm has just appeared.

The Prospectus of Just's Botanischer Jahresbericht brings to notice an unusually useful publication for those working in pure and in applied botany. It aims to summarize the botanical literature of the periodicals, presenting the substance of researches otherwise unavailable to a great majority of workers. Some idea of its scope may be obtained from the subjects treated. Anatomy, physiology, cryptogams, the morphology, biology and systemtics of the phanerogams including teratology and the relations between plants and animals, paleontology, plant geography, pharmaceutical and technical botany and plant diseases form the general features of the work.

In the last, the twentieth volume, 5,300 treatises were considered. Bacteriological and pharmaceutical works are discussed, but only in so far as they are of interest to botanists not specialists in these departments. It appears that this periodical should contribute much of value to pharmaceutical botany and should in turn receive such support from workers in this line as may be possible. One way for authors to contribute to its needs and thus enhance its usefulness would be to send to the editor, Dr. E. Koehne, Friedenau, Berlin, Kirchstr. 5, reprints of such of their publications as are likely to be of interest to botanists. Of the above mentioned number of articles summarized, only 300 were forwarded to the editor and since the *Bericht* is not provided with funds to purchase such articles, the work of the collaborators is greatly increased and time is lost.

The *Bericht* is a work to which the students in every school of pharmacy should have access.

Commercial.

Parke, Davis & Co. send out with their new catalogue the announcement of a further extension of their business organization. Branch houses have been established in New Orleans and in Baltimore.

Experiments recently made with the Antitoxins of Diphtheria, Tetanus, and Septicaemia in the laboratory of the Pasteur Institute have given the following results:

Diphtheria: — The injection to guinea pigs of a quantity of this antitoxin (Gibier's) in the proportion of 1:150,000 of their weight has enabled them to survive an injection of two drops of the virulent culture of diphtheria bacillus administered 24 hours later. One drop of this culture inoculated to the control animals caused death in 24 hours.

If the above figures are valued in immunizing units, according to the formula of Spronck, each ccm. of this diphtheria antitoxin (Gibier's) contains 300 units. The horses from which the serum is taken have received during the last twenty months over 5000 ccm. of diphtheria toxin, each horse receiveing an average of two injections weekly.

Tetanus: — The injection of guinea pigs of a quantity of this antitoxin in a proportion of 1:1,000,000 of their weight enabled them to survive a fatal dose of tetanus toxin. The same dose given to the control animals caused death within 48 hours.

Septicaemia: — (*Erysipelas streptococcus.*) The injection of this antitoxin to rabbits in a proportion of 1:10,000 of their weight has enabled them to resist a dose of streptococcus culture fatal to control animals.

DRUG STORES — Before you buy or sell, send for our circular of information. Inter-State Druggist Agency, Pontiac Bldg. Chicago.

SUPPLEMENT, JUNE 1896.

Universities and Colleges.

University of Utrecht.

The University of Utrecht, Holland, will celebrate its 260th anniversary this year. The festivities will last from June 22. to 27. The principal feature will consist of the reproduction of a tournament arranged in Vienna in honor of emperor Maximilian in June 1560.

Leland Stanford University.

After three years' litigation over the estate of the late Senator Stanford, Mrs. Stanford has at last been enabled to pay the bequest of $2,500,000 which the senator left to Leland Stanford, Jr., university. This payment means an assured income to the institution. The bonds transferred to the university draw interest at the rate of $10,000 a month.

A Bogus Medical College.

Friends of sound medical education will be glad to learn that the Attorney-General of Wisconsin has brought a suit before the Supreme Court against the Wisconsin Eclectic Medical College of Milwaukee which has attracted wide attention through its circulars offering the sale of medical diplomas on the pretence of an examination. The college had no faculty, no library, no instruments, in fact nothing wherewith to carry on medical instruction.

Jurjew (Dorpat).

The expulsion of 96 pharmaceutical students from the University of Dorpat, Russia, by the minister of education has created a sensation. They are stated to have belonged to a society which existed in opposition to the rules of the University and which the rector pronounced anti-Russian in character. They were at the same time expelled from the city.

Homeopathy and Medical Education.

Dr. Schwartz of Cologne calls attention to the fact that homeopathy is no longer practiced according to the precepts of Hanemann, and can, therefore, no longer be considered a special medical discipline. He charges the Prussian cabinet-order of 1843, permitting the establishment of *Hausapotheken*, with class-legislation and points out that the disciples of Rademacher should have been given the same privilege if government action were at all consistent. He further claims that the self-dispensing of the homeopathists stimulates artificially the difference between the two schools. The regular pharmacist should prepare homeopathic prescriptions as well as those of the so-called regular school, in fact it is his duty to prepare both classes with equal care. There is no need of special homeopathic schools, of homeopathic self-dispensing, of homeopathic house-pharmacies etc., but the universities should provide sufficient instruction in the teachings of Hahneman and the preparation of homeopathic remedies to medical and pharmaceutical students respectively.

Institute Pasteur.

The Institute Pasteur, Paris, has just published its report for 1895. The salient feature of the statement appears to be that of 1523 persons treated only 5 succumbed to the injuries. In the fatal cases the symptoms of rabies manifested themselves within fifteen days after the first inocculation; one patient, however, was seized with rabies during the course of the treatment, and has not been included in the figures. A table of statistics contains the figures commencing from 1886, showing that of the 2671 persons treated in that year 25 died, or a mortality of 0.94 percent, while in 1895, of the 1523 treated only 2 died, or a mortality of 0.13 percent.

University of Wisconsin.

The board of regents of the University of Wisconsin has recently made the following promotions in the faculty of the School of Pharmacy:

Lellen S. Cheney, B. S., from instructor in general and pharmaceutical botany to assistant professor of pharmaceutical botany.

Rodney H. True, Ph. D., from instructor in pharmacognosy to assistant professor of pharmacognosy.

Pharmaceutical Commencements.

The Department of Pharmacy of the Northwestern University will hold its annual commencement June 11 at the Auditorium, Chicago.

The fourth week in June will be commencement-week at Michigan and Wisconsin.

The College of Pharmacy of the City of New York held the exercises of the sixty-sixth annual commencement May 7, at the Carnegie Music Hall.

The Pharmaceutical Department of the University of Buffalo held its annual commencement May 5.

The Chicago College of Pharmacy bestowed the degree of Pharmaceutical Chemist upon five, and the degree of Graduate in Pharmacy upon thirty-five of its graduates April 23, at the commencement exercises held in the Schiller Theatre.

Miscellaneous.

The University of Wuerzburg has now a chair in the history of medicine.

Ant. Voga, apothecary in Steinamanger, Austria, has endowed a fund of 5000 fl. for the support of poor pharmaceutical students.

Dr. E. Buchner, docent at the University of Kiel, has been appointed extraordinary professor of inorganic and pharmaceutical chemistry at the University of Tuebingen.

Acting on the advice of several eminent physicians and surgeons, A. A. C. Swinton has decided to equip a special laboratory at 66 Victoria Street, Westminster, S. W., for the practical application of the Roentgen rays in surgery and medicine.

Scientific Societies and Boards.

Calendar of State Pharmaceutical Associations.

Name.	Date.	Place.	Secretary.
Indiana	June 3	Indianapolis	A. Timberlake, Indianapolis.
Kentucky	June 16	Estill Spring	J. W. Gayle, Francfort.
Maine	June	Rockland	C. A. Fowler, Bangor.
Massachusetts	June 16	Pittsfield	J. F. Guerin, Worcester.
Minnesota	June 16	Lake Minnetonka	C. T. Heller, St. Paul.
Missouri	June 9	Excelsior Springs	H. M. Whelpley, St. Louis.
Nebraska	June 2	Lincoln	W. S. Heilman, Tecumseh.
New York	June 23	Buffalo	C. W. Holmes, Elmira.
Ohio	June	Put in Bay	S. C. Hopp, Cleveland.
Pennsylvania	June 9	Gettysburg	J. A. Miller, Harrisburg.
Utah	June 11	Salt Lake	C. H. McCoy, Salt Lake City.

National Academy of Sciences.

The spring meeting of this distinguished association was held in Washington for four days, beginning on April 21.

A considerable number of papers read had one phase or other of the X-rays for their subject. T. C. Mendenhall read a timely paper on the Legislation relating to standards. Although it was possible to elect five new members at this meeting, only two names were accepted: Charles D. Walcott, director of the U. S. Geological Survey, and Robert S. Woodward, professor of mechanics in Columbia University.

The French Academy of Medicine has received a donation of 800,000 francs from Mrs. Audiffred. The interest, or 24,000 francs, is to be paid as a life annuity to a Frenchman or a foreigner, who discovers a specific against tuberculosis of the lungs.

The apothecaries of Hamburg-Altona have united under the motto "Beharrlichkeit führt zum Ziel" (Perseverance conquers) to assist in the demand for the "Maturitätszeugniss" (graduation from the gymnasium) as the fundamental requirement for the pharmaceutical career.

At the final meeting of the New York Section of Society of Chemical Industry a paper on "The education of Chemists" was read by Dr. G. Duisberg. Comp. this journal p. 49.]

Calendar of Boards of Pharmacy.

State and Territory.	Place of Next Meeting.	Date of Next Meeting.	Name and Address of Secretary.
Colorado	Denver	June 12	C. H. Wells, Pueblo.
Michigan	Detroit	June 22	F. W. R. Perry, Detroit.
New York	Syracuse	June 19	E. S. Dawson, Jr., Syracuse.
Oregon	Portland	June 9	D. J. Fry, Salem.
Washington	Seattle	June 8	W. H. T. Barnes, Seattle.
Wisconsin	Madison	June 26	E. B. Heimstreet, Janesville.
Illinois	Chicago	June 16	Frank Fleury, Springfield.
Maine	Augusta	June 10	Fr. P. Partridge, Augusta.

History.

The Hundredth Anniversary of Homeopathy.

Homeopathy this year celebrates its hundredth anniversary. Parts 3 and 4 of Hufeland's journal, Journal der praktischen Arzneikunde und Wundarzneikunst, for 1796 contained an article by Hahnemann: Versuch über ein neues Prinzip zur Auffindung der Heilkräfte der Arzneisubstanzen, neben einigen Blicken auf die bisherigen", which is considered as the genesis of the homeopathic method of curing disease. Homeopathy (from homoia homeio i. d. = similia similibus) resulted as a reaction against the then existing speculative and mystical tendency of medicine and the poly-prescription of physicians. The pharmacotherapy of the regular school at the time of Hahnemann was extremely crude and often did more harm than good, so that, according to Kobert, the change to homeopathy resulted, at that time, in benefit to the patient.

During the past century a complete literature on homeopathy has been created, and this school has had as many violent opponents as devoted disciples. In Prussia, the practice of homeopathy was regulated by the state in 1843. In America homeopathy has, however, found its most fertile field. Whereas Europe maintains homeopathic chairs at Paris, London, Budapest and Madrid, America has a number of homeopathic colleges, and homeopathic hospitals in almost all of the larger cities. Nevertheless, there are about five hundred homeopathic physicians in Germany, and about three hundred homeopathic societies among the laity. Central pharmacies exist in Leipzig, Dresden and Stuttgart.

Expositions.

Second International Exposition at Prag.

The second group (see p. 43) is to contain the modern literature on pharmacy, pharmacognosy, botany and chemistry. Authors and publishers are requested to contribute to this group by sending copies of their works: books, journals, maps etc. The exhibit will be arranged in form of a reading room. No charges will be made unless special arrangement is demanded. For information apply to Emil Graf, Prag, II., Nr. 89, or O. Schreiber, Prag, III., Nr. 203.

Pharmacy at the Exposition in Budapest.

There will be no lack of pharmaceutical expositions in Europe during the coming summer. Section four of the Hungarian millenium exposition will be given to pharmacology and pharmacy.

Personals.

Dr. Hermann Hager has been elected honorary member by the pharmaceutical societies of Moskow and Warsau.

Prof. Behring of Marburg has not announced courses of lectures for the present summer-semester. It is rumored that he expects to withdraw from his duties as professor.

Dr. F. B. Power sailed for Europe Tuesday, May 12, on the North German Lloyd steamship Lahn. He will stop at London before he goes to the continent.

Bibliography.

Ginn & Co., Boston, who have recently issued "Chemical Experiments" by R. P. Williams, now have in press a textbook of Chemical Science by the same author.

Macmillan & Co. announce the completion of the Dictionary of Solubilities Inorganic by Dr. Arthur M. Comey, formerly professor of chemistry, Tuft's College.

The Deutsche Verlags-Anstalt has determined to increase the scope and size of the excellent "Lexikon der gesamten Technik und ihrer Hilfswissenschaften". It was first intended to publish the work in five volumes, but the work has been growing in the hands of the editor, Dr. Lueger, and his host of colaborers so that the publishers do not expect to complete the work in seven volumes. Subscribers, however, will be pleased to learn that anything beyond the seven volumes will be furnished free of cost to them.

The Scientific American will celebrate its fiftieth anniversary this year by issuing a special number July 25. A prize of $250.00 is offered for the best paper on "The progress of invention during the past fifty years."

The new third edition of the Norwegian Pharmacopœa appeared April 1 and went into force at once. The first edition of 1854, the second edition of 1871 and the *Additamenta* of 1879 were printed in the Latin language. The third edition, however, is printed in the Norwegian language.

Geo. Brumder, the publisher of "Our Native Birds of Song and Beauty" by Henry Nehrling, expects to complete this work before the close of the year. The third last number is now in press. The German work has been received most enthusiastically. The English work, which is by no means a mere translation, will no doubt be welcomed by all lovers of our American songsters, who, on account of the language, were barred from enjoying the German edition.

W. T. Keener & Co. of Chicago announce the approaching completion of Prof. Oldberg's new book, The General Principles of Pharmacy. It is to be a textbook of the scientific principles of pharmaceutical practice and the technique of pharmacy.

The third and fourth numbers of the Zeitschrift für Naturwissenschaften, which is the organ of the Naturwissenschaftlicher Verein für Sachsen und Thüringen contains the following original contributions:

"Mittheilungen von einer Reise nach dem Woodtlande und dem Salzwerk zu Bex, mit 1 Karte," by Geh. Bergrath and D. Cramer.

"Ueber Calciumcarbid und Acetylengas," by Prof. Hugo Erdmann.

"Nebenwirkungen von Arznei- und Genussmittel und Giften," by Dr. Roth.

"Verschleppte Schlangen in der Provinz Sachsen," by Dr. med. Schnee.

Commercial.

The Farbwerke at Hoechst near Frankfurt again leads the German chemical industries in the way of profits, which amounted to 6,191,475 Marks. A dividend of 28 p. c. was declared. The antipyrine patent of the factory expires in two years.

The Wisconsin Pharmacal Mfg. Co. has selected Milwaukee as the place for the location of its factory. Work is to begin as soon as the balance of stock is subscribed. Applications for stock should be made to Mr. A. F. Menges, Treasurer, Madison, Wis.

Friends of pure drugs and chemicals were glad to learn that the firm of Fritzsche Bros. of New York came out ahead in their recent vanillin case. In the absence of public stations the work of individuals and firms who expose frauds is of the greatest service to the public. That such persons and firms should be annoyed by law-suits is, possibly, inevitable, but we have reason to congratulate them as well as ourselves whenever fraud receives the rebuke of the law in addition to exposure.

Frederick Stearns & Co. have recently gained a victory over a secret nostrum fraud in the famous "Syrup of Figs" case. The words "Fig" and "Syrup" in combination were claimed as private property for trade mark purposes by the California Fig Syrup Co. It may be of interest to note in connection with this celebrated case that undue protection in this line has also received a set-back in German courts. Application had been made under the new "Wort-schutz" law of Germany for the registration of the word phenacetine. This was at first granted, but upon further investigation it was repealed.

Industrial Activity during 1895.

That the year 1895 has witnessed commercial activity on the incline, is shown by the statistical report of the principal nations.

The experience of England, being the principal market of the world, and therefore influenced most and quickest by the commercial events in all parts of the world, is most instructive in this respect. The Reports on British Commerce for 1895 compare with those of 1894 as follows:

	Imports.		Exports.	
	1894	1895	1894	1895
1st half.......	211	203	137	136 million £.
2nd half......	197	213	137	150 million £.
Total..........	408	416	274	286 million £.

This shows that the depression which prevailed during 1894 had not been overcome at the beginning of 1895, but that it made way for a decided revival as the year progressed. Of the total exports of 286 million £ 226 million were British products, the balance re-exported foreign and colonial products.

Exports of British products varied during the last seven years as follows:

	Increase.	Decrease.
1889............................	3.71%	....
1890............................	....	0.51%
1891............................	....	5.30%
1892............................	....	3.43%
1893............................	....	2.10%
1894............................	3.35%	....
1895............................	8.57%	....

This is an interesting illustration of the fluctuation which commerce made during the last years.

In the U. S. whose commerce is in the closest relation to that of England and continental Europe, a marked improvement in business is noticeable, which increases more rapidly as the year advances. Imports decreased from 841 million dollars in 1892 to 776 in 1893 and 676 in 1894, while during 1895 they increased to 801 millions. Exports during 1894 and 1895 were equal at about 824 million dollars in which the decrease in the value of exported cotton, livestock and provisions, was about offset by the increase in value of exported petroleum (in diminished quantity) and other smaller articles. During the last 3 months of 1895 the increase in exports over those of the corresponding months of 1894 was 12, 24 and 30 million dollars respectively.

The changes in the commerce of the German Empire during the last year can be seen only partially at the present time, inasmuch as the computation of the exports and imports at the actual prices for 1895 is now in progress, and that at the present time it is impossible to tell how much of the change is due to quantitative increase or decrease and how much is due to the fluctuation of prices.

The value of exports and imports for the last two years compares as follows:

	Imports.	Exports.
1894	4285	3051 mil. marks.
1895	4216	3416 mil. marks.
More	1	365 mil. marks.
Less	69	...... mil. marks.

This comparison changes somewhat when deducting precious metals. There results a loss of imports of 349 million. In the first figure spun articles have a large share and in the latter woven goods; the products of the chemical industry also have contributed largely to the increase of exports, and amounts to 38 million of drugs, druggist's and dyer's materials.

In the revenue domain of Austro-Hungary the imports exclusive of precious metals amounted to 727 million gulden (against 700 million in 1894) and exports 742 million gulden (against 795 million in 1894). The decrease of exports is mostly in agricultural products, whereas industrial products show a slight increase in exports.

The statistics of French commerce show imports for 3699 million francs (against 3850 million in 1894) and exports of 3388 million francs (against 3078 million in 1894). The demand of imports decreased mainly in articles of food (to the extent of 172 million francs) while the increase in exports is attributable to raw and auxiliary materials for manufactures to the extent of 112 million francs and to finished manufactures to the amount of 209 million francs.

This short review of the commercial statistics of five leading countries, justifies by figures the assertion that the year 1895 can be considered as marking the beginning of a revival of industrial activity.

The effect of this increased activity upon prices cannot be accurately ascertained at this time so long as actual values for 1895 have not been computed.

[Commercial Report of Gehe & Co., Dresden.]

DRUG STORES—Before you buy or sell, send for our circular of information. Inter-State Druggist Agency, Pontiac Bldg., Chicago.

For clerks or vacant positions in Wisconsin drugstores apply to Wisconsin Druggists Exchange, E. B. Heimstreet, Janesville.

Sanitation and Hygiene.

Leprosy in America.

A year or more ago the fate of a poor leprous Chinaman, who was compelled to live alone in a rude hut on an island near New York, and who perished miserably by finally refusing to partake of the food passed in at the door of his living tomb, attracted considerable attention. There are now four patients living in a temporary lazaretto. One is a Chinaman, two are negroes and the fourth is an Italian, but now a citizen of the United States. The editor of the Medical News calls attention to the peculiar fact that so many leprous patients, who have come under his observation or of whom he has kept a record, were cooks.

According to a newspaper clipping, a seventeen-year-old boy, an orphan, in Grand Forks County, North Dakota, has been ejected by society to live alone. The editor justly questions whether we are living at the threshold of the twentieth century in a Christian land.

In Louisiana, where the necessity for action has become imperative, a hospital has been established on the Mississippi, made up of eight cottages surrounding a fine old plantation house; but in spite of the "Arcadian scenery" and other attractions of the place, which offers accomodations for one hundred inmates, few can be induced, without the use of force, to avail themselves of it. From recent reports the disease would appear to be increasing at the expense of the native-born population in and about New Orleans, and it would seem to be as much a matter of national as of state interest to check its spread. As far back as 1888 Dr. Blanc reported forty-two cases of leprosy.

As to the existence of leprosy in countries upon our borders it is to be found in Canada, British Columbia, Mexico, Cuba and the West Indies in general. In Havana a leper house was established as early as 1681, but the disease had begun to diminish until a decided Chinese immigration set in. Now it is difficult to say how many lepers are on the island, but the hospital itself usually shows a census of a little less than one hundred. In Jamaica the leper population has been estimated at 450, or 1 to each 1380 of the residents of the island. [The Med. News, 68, p. 297.]

A new lazaretto costing about $20,000 was recently erected at Tracadie, N. B. There are now nine male and sixteen female patients in the hospital. Nine lepers now held in confinement in British Columbia are to be added to this number. For many years Dr. A. C. Smith has been in charge of this institution. Regarding the result of his experience with leprous patients, he says that no specific cure for leprosy has yet been discovered. His predecessor, Dr. Nicholson, and also Dr. Smith treated several of the lepers with colored water, to see if the influence of the mind over the body would cause a change, and in every instance it did so. For a time all symptoms of the disease were in abeyance and there was a decided improvement, but this was only for a time, and it seemed as though the disease made up for lost time afterwards. [Medical Record, 49, p.309.]

According to F. F. Wesbrook, direct sunlight destroys cholera bacilli if they are in contact with air, but aids by its heating power the growth of those not in free contact with air.

SUPPLEMENT, JULY 1896.

Universities and Colleges.

Columbia University.

Dr. N. S. Britton, professor of botany in Columbia University has been appointed director of the New York Botanical Garden, and the place so made vacant has been filled by the appointment of Dr. Lucien M. Underwood, now professor of botany in Alabama Polytechnic Institute.

University of Wuerzburg.

On the 10th of May the new chemical laboratory, erected at an expense of M. 650,000, was dedicated. It is largely constructed after the plan of the Zuerich laboratory, and has all modern improvements. The auditorium has a capacity for 220 and the four large laboratories working places for 148.

Chicago College of Pharmacy.

The Chicago School of Pharmacy which has recently become the School of Pharmacy of the University of Illinois announces the opening of its thirty-seventh session upon Tuesday October 6th, 1896.

The faculty will consist of F. M. Goodman, Professor of Botany and Materia Medica, C. S. N. Hallberg, Professor of Pharmacy and Director of the Dispensing Laboratory, W. A. Puckner, Professor of Chemistry and Director of the Chemical Laboratory, F. S. Hereth, Director of the Pharmaceutical Laboratory, W. B. Day, Director of the Microscopical Laboratory, A. D. Thorburn, Instructor in Chemistry, Geo. E. Case, Instructor in Pharmacy, and L. I. Schreiner, Assistant in Microscopy.

The course will consist of two terms of twenty-eight weeks each for the degree of Graduate in Pharmacy.

University of Wisconsin.

Commencement exercises began Sunday, June 21, on the afternoon of which day President Adams delivered the baccalaureate address. His subject was The University and the State. Among the exercises on Monday the address before the School of Pharmacy by Mr. Malcolm B. Jeffris of Janesville should be mentioned. Mr. Jeffris has been counsel for the State Board since its organization and has upheld the state law in all three courts of the state.

At 9:30 Wednesday morning the commencement exercises were held in the Armory Hall of the New Gymnasium. Of the 278 graduates from the various colleges and courses 10 were from the School of Pharmacy. Three of these graduated with the degree of Bachelor of Science, in Pharmacy, from the four years' course; the other seven as Ph. G. from the two and three years' courses. More than half of the graduates had pursued more than two full collegiate years of study at the University.

Wednesday evening the annual banquet of the pharmaceutical alumni was held at the Capital House.

The new catalogues of the University of Wisconsin are now ready. They can be had upon application to either Mr. E. F. Riley, Secy., or Mr. W. D. Hiestand, Registrar.

The Wisconsin Summer School begins its ninth annual session July 6 and ends Aug. 14. Among the courses offered, attention may here be called to those in the departments of physics, chemistry, botany and physiology. For details see pp. 248—261 of the university catalogue.

St. Louis College of Pharmacy.

The following resolutions of respect, in honor of Dr. Charles O. Curtman, were passed at a recent meeting of the college: —

Resolved, That it is with deep sorrow that we record the death of Dr. Chas. O. Curtman who was for eleven years a member of this Association and who, in the chair of chemistry, was one of its most successful teachers and did much in building up the reputation of the college.

Resolved, That in him whose loss we lament we recognize one who has wielded a wide influence because of his ability and aptness in his chosen vocation; one who has done much to disseminate knowledge, awaken thought and encourage the scientific spirit.

Resolved, That we recognize with pride the work in medical and pharmaceutical chemistry which has given him an international reputation and which we, as fellow citizens of St. Louis, in a small measure share with him.

Resolved, That while the industry, patience and thoroughness with which he has pursued his investigations in many branches of science has challenged our admiration we also bear testimony to the many good personal qualities which have attached him to us as a friend.

Resolved, That these resolutions be spread upon the records of the College, be furnished the pharmaceutical press for publication and that an engrossed copy be transmitted to the family.

Chas. Gietner, Pres.
J. B. Falk, Sec'y.

Paris Superior School of Pharmacy.

M. Planchon, in his annual official report on the Paris Superior School of Pharmacy for the scholastic year 1894-95, states that the total number of students is 1802, or 86 more than during the preceding twelve months. Far, however, from expressing satisfaction at the increasing number of students, M. Planchon points out that the work of the school is considerably hindered by the want of space, especially in the laboratories for practical work. He approves the principle of equipping provincial schools as completely as the Parisian, so as to prevent an undue influx of provincials to the metropolis; and he expresses a hope that when the "too lengthily elaborated" Pharmacy Act becomes law, the second-class pharmacists' degree will be abolished, which will enable him to "still further raise the scientific status of the school." It may be remarked that the percentage of students for the second class diploma continually decreases; over two-thirds of the students now inscribe themselves for the first-class degree.

Unlike the School of Medicine, where lady-students and foreigners are so numerous (there are three English and 151 Russian lady-students, also 193 Russians and 15 Englishmen there) the foreign element at the School of Pharmacy is but small. Of the twenty-seven born outside France, eight are Turks and four Russians (including one lady.) There are no English subjects; and the French lady-students do not number half a dozen. Diplomas were granted to 144 first-class and 34 second-class pharmacists, while two pharmacists obtained the "diplome supérieur." The superior diploma was founded in 1878 and is equivalent to a doctorate. It qualifies its possessors for professorship in the Superior School of Pharmacy or for the chair of pharmaceutical sciences in mixed faculties.

Besides these, 111 herborists presented themselves for examination, to 75 of whom certificates were granted. M. Planchon regrets to observe that the diminution in these recently noted was only temporary, and that these "too numerous" practitioners still carry on a "clandestine competition" with the qualified pharmacist. "The hour has come" he considers, "to cut out the evil by the roots."

Scientific Societies.

Calendar of State Pharmaceutical Associations.

Name.	Date.	Place.	Secretary.
Colorado	July 14	Denver	J. Kochran, Denver.
Illinois	July 28	Springfield	F. Fleury, Springfield.
Iowa	July 15	Clear Lake	A. H. Miles, Des Moines,
North Dakota	July 28	Fargo	W. S. Parker, Lisbon.
Rhode Island	July 8	Providence	Wm. E. Cates, Providence.
South Dakota	July 28	Lake Madison	I. A. Keith, Lake Preston.
Tennessee	July 15	Crawfish Springs	R. W. Vickers, Murfreesboro.
Virginia	July 16	Blue Ridge Springs	C. B. Fleet, Lynchburg.

American Association for the Advancement of Science.

The local committee of the A^3S has sent out its preliminary announcement of the forty-fifth meeting of the American Association for the Advancement of Science to be held in Buffalo, N. Y., Aug. 22nd to 29th. The pamphlet includes a preliminary announcement of the meetings of several affiliated scientific societies that will hold their sessions in Buffalo, Aug. 19th, 22nd, and Aug. 31st to Sept. 2nd.

National Eclectic Medical Association.

The National Eclectic Medical Association has issued a handsome Souvenir of the 26th annual meeting which was held at Portland, Oregon, June 16—18, of this year. A very tempting trip is outlined for those who could attend.

Arkansas Pharmaceutical Association.

The 14th annual meeting was held at Little Rock, May 12th, 13th and 14th. An unusually good attendance and a good meeting is reported. The next meeting will be held at the same place on the second Tuesday of May 1897. The officers elected were as follows: Prest., J. M. Sparks, Fort Smith; 1st V. P., F. G. Kerr, Van Buren; 2nd V. P., J. B. Aichart, Lonoke; Secty., John B. Bond Jr., Little Rock; Treas., Jno. A. Jungkirch, Little Rock.

Minnesota Pharmaceutical Association.

The principal feature of the meeting at Lake Minnetonka last month was an address by Prof. A. B. Prescott of Ann Arbor, Mich., on "The function of pharmacy in the social body, its responsibilities to the public and to the physician." An abstract of this addresss will be found on p. 159 of this number.

Missouri Pharmaceutical Association.

The eighteenth annual meeting was held at Excelsior Springs, June 9, 10, 11 and 12. Among the papers read the following of scientific interest may be mentioned:

Process for the preparation of spirit of nitrous ether, with practical demonstration, by Prof. David Walker of Kansas City.

Problems in organic chemistry, by Prof. J. M. Good of St. Louis.

Methods of detecting drug adulterations, with illustrations, by Prof. Francis Hemm of St. Louis.

A new method of preserving fruits and flowers, by John Wright of Indianapolis.

The following officers were elected: President, Eugene Soper, St. Joseph; First Vice-President, F. W. Sennewald, St. Louis; Second Vice-President, Dr. D. K. Morton, Missouri City; Third Vice-President, W. R. Scheldrup, Pierce City; Secretary, Dr. H. M. Whelpley, St. Louis; Treasurer, William Mittelbach, Boonville; Assistant Secretary, Ambrose Mueller, St. Louis; Local Secretary, Thomas Layton, St. Louis; Members of the Council: J. M. Good of St. Louis, J. M. Love of Kansas City, R. E. Maupin of Pattonsburg, C. E. Corcoran of Kansas City, and Miss Fredrica De Wyl of Jefferson City.

State Boards of Pharmacy.

Calendar of Boards of Pharmacy.

State and Territory.	Place of Next Meeting.	Date of Next Meeting.	Name and Address of Secretary.
Illinois	Springfield	July 30	Frank Fleury, Springfield.
Minnesota	Minneapolis	July 7	H. G. Webster, Minneapolis.
Missouri	Sedalia	July 6	F. W. Sennewald, St. Louis.
N. Carolina	Morehead	July 21	W. Simpson, Raleigh.
Ohio	Toledo	July 14	W. R. Ogier, Columbus.
Oklahoma	Oklahoma Cy	July 7	E. E. Howendobler Perry.
S. Carolina	Charleston	July 18	H. W. Hummel, Charleston.
Tennessee	Nashville	July 14	J. O. Burge, Nashville

Wisconsin State Board.

The Board at its June meeting in Madison examined 34 candidates, of whom 16 were rejected. The names of the successful candidates are:

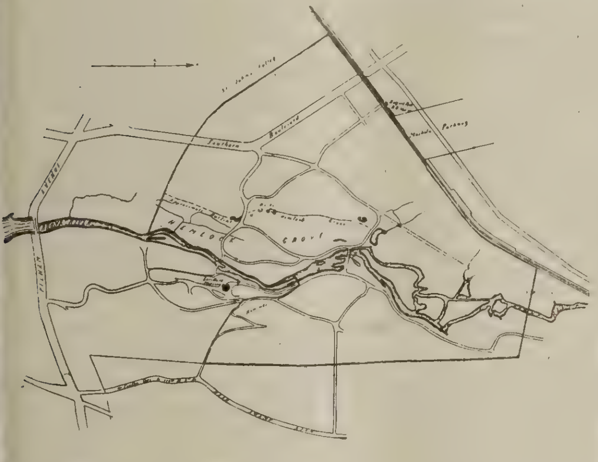
Licentiates: — Laura M. Jones, Madison; H. J. Kamps, Marshfield; C. H. Henton, Otsego; Libbie Higgins, Eagle River; E. W. Meinecke, Milwaukee; E. F. Freytag, Milwaukee; O. C. Stockmeyer, Two Rivers; J. W. Palmer, Sparta; F. C. O. Muenich, Lancaster.

Assistants: — W. R. Schuman, Prairie du Chien. G. W. Otto, and E. Bressler, Milwaukee; A. E. Godfery, Whitewater; G. E. Bilstad, Cambridge; E. B. Duncan, Baraboo; H. L. Holderness, Kenosha.

Botanical Gardens.

New York Botanical Garden.

This infant corporation is not only established on a financial basis that assures future success — over $250,000 subscription and $500,000 of City Bonds, — but has already begun work on the park itself. A tract of 250 acres of Bronx Park has been turned over by the Park Commission to the Board of Directors of the Garden. A topographic map of 50 ft. to the inch and five foot contours has been made to serve as the basis for future work. Any one acquainted with the nature of upper New York north of the Harlem River can, aided by a glance at the accompanying map, form a fair idea of the nature of the grounds. That part of the Park, called Hemlock Grove is to remain as far as practicable in its present condition. Plans for building a Museum and Herbarium, and an Horticultural Building have already been submitted to the Board.



The labeling of about forty species of trees on the ground was begun last fall, a temporary nursery was started, and $5,000 of plants have been promised by a New York gardener. Columbia College is going to co-operate with the Garden. It will place its herbarium and library in the new fire proof building when completed and will in return enjoy the educational facilities of the Garden, particularly for graduate instruction in botany. The J. B. Ellis, (Newfield, N. J.) herbarium of some 75,000 specimens of fungi together with the accompanying library has been purchased. Besides this a course of lectures, in co-operation with the American Museum of Natural History, inaugurated by Dr. D. Morris, Assistant Director of the Royal Gardens at Kew, England, has been begun. No. 1 of Vol. 1 of the Bulletin of the New York Botanical Garden was issued in April of this year. It contains an account of the progress of the garden.

Bibliography.

The editor of the Technology Quarterly, Massachusetts Institute of Technology, Boston, announces that the Review of Am. Chem. Research will this year be issued also in the form of separate reprints from the journal. The reprints will, like the journal, be issued quarterly and will be repaged and provided at the close of the year with title page and index, thus making the Review a volume complete in itself. The price of subscription is $1.50 per annum.

Fr. Eugen Koehler of Gera-Untermhaus* is now publishing a supplementary volume to the two volumes of Medicinalpflanzen which appeared in the years from 1883—1890. The first fascicle of the new undertaking, published under the title of Koehler's Neueste und wichtigste Medicinal-Pflanzen in naturgetreuen Abbildungen mit kurz erklärendem Texte, contains four colored plates with text. Fascicles two and three are soon to appear. The volume is to be complete in about 15 fascicles.

Macmillan & Co. will publish immediately an entirely new edition of the The Nursery Book, thoroughly recast and revised by the author, Professor S. H. Bailey, of Cornell University.

The same publishers also announce for early publication vol. I. of the Columbia University Botanical Series, entitled Elementary Botany; by Dr. Carlton C. Curtis, tutor in botany, Columbia University.

The June number of the Bulletin of the Am. Acad. of Med. (Eaton, Pa.) contains in addition to the proceedings of the Am. Acad. of Med., the Assoc. of Am. Med. Colleges, and Confederation of State Med. Examiners, Dr. George M. Goulds' address on Vivisection.

The Columbine Leaflet issued by The Columbine Association contains an abstract of several articles by F. Le Roy Sargent, in which the writer presents his arguments why the columbine should be our national flower. The leaflet can be had (at three cents each) upon application to Mr. J. S. Pray, Secy., P. O. Box 2774, Boston, Mass.,

Gebrueder Borntraeger, Berlin, Germany, announce the publication of the German edition by Dr. Emil Knoblauch of Dr. Eugenius Warmig's Lehrbuch der bekologischen Pflanzengeographie, eine Einführung in die Kenntniss der Pflanzenvereine.

Heft IV. of H. Behrens' Anleitung zur mikrochemischen Analyse, the third fascicle of which has just appeared, may be expected some time during the summer of this year. It is to contain the carbamines, aliphatic and aromatic acids. For contents of fascicle three and publishers see p. 166 of this number.

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* Geo. Brumder, Milwaukee, Wis., agent.

An international archive for the history of medicine and medical geography is to be published in Amsterdam under the title of "Janus". So far there exists no journal of this kind in Europe. It is to be truly international and papers can be published in the German, English or French language. A large commercial corporation has promised financial support. Secretary of the new undertaking is Dr. H. F. A. Peijpers in Amsterdam (Parkweg), Holland.

The Graduate Courses for 1896—'97, offered by twenty-three of our leading colleges and universities, is now ready. Leach, Shewell & Sanborn are the publishers.

Felix Alcan, of Paris, announces as one of his new publications the sixth edition of the Dictionaire de Médicine, par les Drs. E. Bouchert et A. Derprés.

It is stated that the fourth edition of the Mexican Pharmacopœia is to appear soon. The first was published in 1846, the second in 1874, the third in 1884 and a supplement in 1890.

In No. 13 of vol. 45 of Die Natur (G. Schwetschke'' scher Verlag, Hall und Saale) Dr. Karl Mueller, one of the founders and for forty-five years editor of that journal, bids farewell to his readers in a very interesting article on "The Philosophy of Nature." The next number contains an introductory note by Dr. Otto Taschenberg, the new editor. The April number, like its precursors, is replete with interest to the student of nature. Of papers which are of more or less technical value to the pharmacists several might be mentioned:—

Dr. G. Baumert.—Aus dem Gebiete der Nahrungsmittel-Chemie:

I. Einiges über Fleisch und Fleischwaren;

II. Ueber Milch und ihre Verfälschung.

Prof. Georg Kraus.—Warum der Botaniker in die Tropen muss.

Prof. W. Zopf.—Ueber den Nutzen der Flechten.

With the view of increasing the distribution of the annual reports of the proceedings of the association and to enable the members to complete their sets at very low figures, the committee on publication of the American Pharmaceutical Association has been authorized to offer a reduction of fifty percent on the price of all proceedings published prior to 1891. The schedule of reduced prices may be found on page XXVII of volume 43 for 1895. The reports for 1856 and 1859 are out of print and none were published in 1861.

All orders for books should be addressed to Chas. Caspari Jr., Permanent Secretary, 109 Aisquith St., Baltimore, Md.

Catalogues Received:

Félix Alcan, Paris: Hygiène—Médicine et Chirurgie.

Lemcke & Buechner, New York: Monthly Bulletin of World Literature.

Mayer & Mueller, Berlin: Wegweiser durch die Litteratur der chemischen Technologie.

Ludwig Rosenthal's Antiquariat, Muenchen.
Katalog 93: Alte Medicin bis zum Jahre 1799.
Katalog 94: Medicin seit dem Jahre 1800.

Commercial.

Sicilian Sulphur Industry.

A Reuter's telegram from Rome says that one of the chief questions now engaging the attention of the Italian Cabinet is that of the emelioration of the sulphur industry of Sicily which is at present in a very depressed condition, owing to the competition of pyrites for the production of sulphuric acid, and the fact of the supply now largely exceeding the demand, not to mention the threatened rivalry of Japanese sulphur. The price has fallen from 140 lire to 60 lire per ton. It is now proposed to abolish the export duty of 20 percent, which formerly yielded an annual revenue of 3,400,000 lire. In order to make good the deficit thus caused to the revenue, it is proposed to levy a tax of 1 lira per ton on sulphur exported from Sicily, to increase the imported duty on barley and white maize from 1.15 lira to 4 lire, and to introduce a statistical fee ranging from 10 centimes per quintal to 10 centimes per ton on imported goods not specified in the treatise of commerce.

Price Lists Received.

Preis-Liste der Droguen-Handlung G. & R. Fritz, Wien, pp. 224, Jan. 1896.

Vorzugs-Preis der Medicinal-Droguen-Handlung en gros G. & R. Fritz, Wien, pp. 56, Mitte Mai, 1896.

Preis-Liste von Pezoldt & Suess in Wien, with Mentor für die Namen neuerer Arzneimittel. pp. 196, Jan. 1896.

Sharp and Dohme, Baltimore, Md.

Dr. Theodore Schuchardt, Goerlitz, May, 1896.

Vereinigte Chininfabriken, Zimmer & Co., Frankfurt a. M., Mai, 1886.

Gehe & Co. of Dresden announce as a novelty the introduction into the market of ethyl chloride in metal flasks. A mixture of ethyl chloride with the lower boiling methyl chloride is brought into the market in similar flasks under the name of *anestile.*

Of 70 drugs examined by the State Board of Health of Massachusetts during the week ending May 9th, 48 were found of good quality and 22 were adulterated or varied from the legal standard.

DRUG STORES—Before you buy or sell, send for our circular of information. Inter-State Druggist Agency, Pontiac Bldg., Chicago.

For clerks or vacant positions in Wisconsin drugstores apply to Wisconsin Druggists Exchange, E. B. Heimstreet, Janesville.

B. Herder, bookseller, publisher and importer, whose principal depot is in Freiburg, Baden (established in 1801) has a branch office in St. Louis, Mo.

Ferdinand Enke of Stuttgart has begun to publish Sammlung chemischer und chemisch-technischer Vorträge under the editorship of Prof. Felix B. Ahrens.

SUPPLEMENT, AUGUST 1896.

Universities and Colleges.

Cleveland School of Pharmacy.

The course of instruction has been extended to three years. The degree of Pharmaceutical Chemist will hereafter be conferred upon graduates.

California College of Pharmacy.

Chas A. Seifert, Professor of Theory and Practice of Pharmacy has resigned, and Prof. John Calvert was elected to fill the vacancy. Prof. Calvert filled the same chair in 1874 and 1875.

Missouri Medical College.

Professor Francis Hemm, director of the pharmaceutical laboratory of the St. Louis College of Pharmacy, has been elected to fill the position of professor of chemistry in the Missouri Medical College, St. Louis, made vacant by the death of Dr. Charles O. Curtman.

School of Pharmacy of the Pharm. Soc.

The vacancy caused by the resignation of Professor Attfield, professor of chemistry of the British Pharmaceutical Society School of Pharmacy has been filled by the election of Dr. Collie, who will also have charge of the Research Laboratory. Dr. Collie comes highly recommended by Prof. Ramsay, with whom he has been engaged in the investigation of argon and helium. He has occupied several minor positions in England and s a graduate of the University of Wuerzburg, but according to his own statement has had "no direct pharmaceutical experience."

Catalogues Received.

Cleveland School of Pharmacy. Fifteenth Annual Announcement, Session of 1896—'97.

Massachusetts College of Pharmacy, Boston, Mass. Thirtieth Annual Catalogue. 1896—'97.

Northwestern University School of Pharmacy, Chicago, Ill. Circular of Information for 1896—'97.

Ontario College of Pharmacy, Toronto, anada. (Affiliated with University of Toronto.) Annual Announcement, seventeenth Session 1896—'97.

Philadelphia College of Pharmacy, Philadelhia, Pa. The seventy-sixth Annual Announcement.

The University of Minnesota, Minneapolis, Minn. Catalogue of the College of Medicine and Surgery 896—'97.

Scientific Societies.

Calendar of State Pharmaceutical Associations.

Name.	Date.	Place.	Secretary.
Michigan	Aug. 4......	Mackinaw Island	Ben Schroeder, Grand Rapids.
Montana	Aug. —......	Helena..........	J. B. Lockwood, Helena.
ermont	Aug. 21....	Montpelier....	H. A. Chapin, Brattleboro.
Wisconsin	Aug. 15....	Stevens Point	E. B. Heimstreet, Janesville.

Austin-Flint Medical Society.

At a recent meeting this society passed a resolution demanding that editors of lay papers in that district refrain from publishing notices of surgical operations, or other news matter containing the names of physicians.

Belgian Pharmaceutical Association.

The Association générale pharmaceutique of Brussels, which has recently celebrated its fiftieth anniversary, has determined to leave professional matters entirely to the newly created Fédération Belge des Sociétés de Pharmacie, and to give all of its time and attention to purely scientific matters.

British Pharmaceutical Society.

The council of the Pharmaceutical Society of Great Britain has recently elected three honorary members:

Dr. Isaac Bayley Balfour, professor of botany, Edinburgh University, and regius keeper of the botanic Gardens there;

Dr. Wilhelm Oswald Alexander Tscherch, professor of pharmacognosy at the University of Berne, Switzerland;

Dr. Thomas Edward Thorpe, chemist and director of the Inland Revenue Laboratories.

American Pharmaceutical Association.

The forty fourth annual meeting will be held at Montreal, Canada, beginning Wednesday, August 12th, 1896, at 3 o'clock P. M. The first session of the Council will be held at the same date at 10 o'clock A. M.

Credentials of Delegates should reach the Permanent Secretary at his office not later than August 4th; after that date they should be sent in care of the Local Secretary.

Propositions for Membership may be sent to the Secretary of the Committee, Geo. W. Kennedy, Pottsville, Pa., up to August 7th, after which date they should be sent to him at the Windsor Hotel, Montreal.

Essays and Papers to be read at the meeting should be forwarded without delay to the Chairman of the respective Sections, viz.: Education and Legislation, Prof. C. S. N. Hallberg, Chicago, Ill.; Scientific Papers, Prof. S. P. Sadtler, Philadelphia, Pa.; Commercial Interests, Geo. J. Seabury, Esq., New York, N. Y. Papers received after July 20th, cannot be printed in time for the meeting.

The Committee of Arrangements have issued a circular of information, a copy of which has been mailed to every member. Headquarters of the Association will be at the Windsor Hotel. Quarters may be secured in advance by addressing the Local Secretary, Joseph E. Morrison, 43 Church St., Montreal, Can.; in order to avoid a rush and confusion early application should be made for the same.

The Chairman of the Committee on Transportation has furnished the following information which will no doubt be supplemented by individual circulars for the different sections. All the railroads of the Trunk Line, Central, Western and Southern Passenger Associations have agreed to furnish a rate of 1⅓ fare on the certificate plan. In purchasing a ticket a certificate properly signed by the agent must be secured, upon presentation of which to the Ticket Agent at Montreal, after countersignature by the Permanent Secretary, a return ticket will be issued at one-third fare. Tickets to Montreal must be purchased between August 9th and 15th and return tickets within three days after final adjournment of the meeting.

The New England delegation will leave Boston on Monday, August 10th, at 9.40 A. M. by Boston and Maine R. R., reaching the Crawford House at 3.20 P. M. Here the party will remain until Tuesday at 12.35 P. M., thus giving an opportunity of enjoying White Mountain scenery. Arrive in Montreal at 8.30 P. M.

The New York, Pennsylvania and South-Eastern delegations will leave New York by the Delaware and Hudson River R. R. on Tuesday morning, August 11th, passing through the Adirondacks and reaching Montreal the same evening.

The Western delegations will meet at Chicago and leave there by the WABASH R. R. on Sunday afternoon, August 9th, for Toronto, Can., where one of the Richelieu and Ontario Navigation Co.'s steamers will be taken and the rest of the trip made by boat to Montreal, arriving about 8 P. M. on Tuesday.

Special information, if desired, may be obtained from the members of the Committee, Joseph E. Morrison, Montreal, Can., Chairman, Albert E. Ebert, Chicago, Ill., Sam'l A. D. Sheppard, Boston, Mass.; Chas. M. Ford, Denver, Col.; Harry Sharp, Atlanta, Ga.; Wm. J. M. Gordon, Cincinnati, O.; Henry W. Whelpley, St. Louis, Mo.; C. A. Mayo, New York, N. Y.; Louis F. Chalin, New Orleans, La.; W. M. Searby, San Francisco, Cal.; Karl Simmon, St. Paul, Minn.

CHAS. CASPARI, JR., Permanent Secretary.

Calendar of Boards of Pharmacy.

State and Territory.	Place of Next Meeting.	Date of Next Meeting.	Name and Address of Secretary.
Maine	Portland	Aug. 12	FrankR.Partridge, Augusta.
Michigan	Marquette	Aug. 7	F. W. R. Perry, Detroit.
Nebraska	Lincoln	Aug. 12	Griff. J. Evans, Hastings.
Wisconsin	Stevens Point	Aug. 17	E. B. Heimstreet, Janesville.

Botanical Gardens.

Missouri Botanical Garden.

The seventh annual report has just been issued. The Garden is in an excellent financial position. According to the report of the Director the Garden now contains 301 named species of trees, 561 of shrubs, 1,129 of hardy perennial herbaceous flowering plants, of which 74 are grasses, 178 composites, and 39 hardy ferns etc. Besides a *Victoria regia* cultivated in a pond especially constructed for that purpose, 35 named species or varieties of aquatic and tender marsh phanerogams are growing in the Garden. There are also in cultivation 156 named species or varieties of greenhouse orchids, 93 of aroids, 65 of palms, 11 of cycads, 224 of foliage plants, 51 of yuccas, dracaenas, furcraeas etc., 22 of ficus, 194 of plants yielding useful products, 217 of plants cultivated for their flowers, 526 of succulents, of which 91 are agaves, 306 are cacti, and 93 are aloids, mesembryanthemums, and cotyledrus, and 12 sorts of nepenthes, and 84 ferns and the like.

In 1895 a system of recording accessions to the collection of plants at the Garden was adopted, modeled after that in use at Kew. The total number of named species and varieties, other than annuals, cultivated at the end of 1895, was 3,921.

A collection of nearly 500 species or varieties of hardy plants, for the most part of Japanese origin, was donated by Prof. Sargent of the Arnold Arboretum.

The herbarium has been increased by the incorporation of 10,635 sheets of specimens. The herbarium now has a total of 242,162 mounted plants.

The Sturtevant Prelinnean library mentioned in an earlier report has been catalogued, a printed copy of the catalogue appearing with this years Report and also as a separate.

Bibliography.

A Lehrbuch der Botanik by Dr. Max Reess, Professor of Botany at the University of Erlangen has just been published by Ferdinand Euke of Stuttgart.

Friedr. Vieweg & Sohn announce that the Jahresbericht über die Fortschritte der Chemie, which is generally known as Liebig's und Kopp's Jahresbericht, and which was edited in recent years by Prof. Fittica of Marburg, will hereafter be edited by Prof. v. Buchka of Berlin. The volumes for 1891 and 1892 will be completed by Prof. Fittika, the volume for 1893 and later ones will be edited by Prof. Buchka. The Jahresbericht will also be reorganized. It will be made a yearbook of the progress of pure chemistry and the collateral subjects of physics, crystallography, mineralogy, geology, physiology, bacteriology, technology will be dropped. The preparation of the volumes for 1893 and 1896 has begun. The latter is to appear in the first half of next year. The publishers expect hereafter to have each volume ready promptly. The volumes for 1894 and 1895 will be published as soon as the older ones are disposed of.

The Hygienisches Taschenbuch for medical officers, physicians, teachers etc., by Prof. Erwin v. Esmarch has just been published by Julius Springer. As the title indicates it is not to take the place of larger handbooks but is a practical pocket guide.

Herman Heyfelder of Berlin has just published:—
Die Derivate des Naphtalins, welche für die Technik Interesse besitzen, compiled by Ernst Taeuber and Raynor Norman; also

Der unlautere Wettbetrieb nach dem zweiten "Entwurf eines Gesetzes zur Bekämpfung des unlauteren Weltbewerbes" und über den Rechtsschutz von Fabrikations- und Geschäftsgeheimnissen, by Dr. W. Reuling, Kaiserl. Justizrath.

The publication of a special journal to care for the specific interests of Physical Chemistry in English will date from the issue of the initial number in October of this year. This Journal of Physical Chemistry is to be issued upon the first of every month, except that in July, August and September no number will appear. It will contain articles embodying original research in all branches of Experimental and Theoretical Physical

Chemistry; and this matter will be supplemented by thorough and prompt reviews of the current literature of the subject, i. e. of all journal articles and books which bear upon any phase of it. The new publication, edited by Wilder D. Bancroft and Joseph E. Trevor, Assistant Professors of Physical Chemistry in Cornell University, will accordingly present a continuous and complete account of all work done in the field in question after June of this year.

A copiously illustrated article on Science at the University of Pennsylvania will be contributed to Appletons' Popular Science Monthly for August by Lewis R. Harley. This account describes the establishment of department after department for scientific study, and shows the university to be remarkably well equipped on this side.

Catalogues received:—

Lemcke & Buechner, formerly B. Westemann & Co., New York. Monthly Bulletin of World-Literature. 1896. No. 6.

Gustav E. Stechert, New York. Monthly List of New Publications. June 1896.

In Memoriam.

Professor August Kekulé.

"Ich bin mit Ehrenbezeugungen so überhäuft, dass mir zum Dank nicht nur die Worte, dass mir die Gedanken fehlen. Wo soll ich anfangen? Wie soll ich enden? Noch niemals, seitdem Wissenschaft betrieben wird, ist ein Lebender in solcher Weise von seinen Fachgenossen gefeiert worden. Noch niemals hat man für eine wissenschaftliche Arbeit nach nur 25 Jahren ein Jubiläum gefeiert."

With these words Prof. Kekulé introduced one of the most fascinating bits of autobiography ever spoken or written. The 11th of March, 1890, is a red letter day in the calendar of the German Chemical Society. It was the day of the *Kekuléfeier* in Berlin. The chemical societies of all civilized countries had sent their representatives with messages of congratulation; Prof. v. Baeyer, a former pupil and friend of Kekulé, had discussed the benzol theory in the light of twenty-five years of research and experience; the representatives of the dye stuff industry had had the portrait of the chemical philosopher painted by Prof. Angeli, which was to find a permanent abode in the National Gallery. The meeting was an inspiration to those who were present. The modest person, upon whom so much glory was bestowed, was puzzled for a moment, the brilliant speaker, however, soon was master of the situation.

August Kekulé was born in Darmstadt Sept. 7, 1829. He became docent in Heidelberg in 1856 and was professor of chemistry in Ghent from 1858—1865. In the latter year he went to Bonn, where he was active to his end. Through his Lehrbuch der organischen Chemie (which began to appear in 1859, but which was never completed by himself), in which his broadened theory of types and later the structural theory were carried out logically, he had a great influence upon the rising generation of chemists. Through his happy conception of benzol as hexa methenyl, which forms the foundation of the so-called aromatic compounds, he greatly influenced experimental research and gave to much of it a course which is still being pursued largely. In his investigations on mercuric fulminate, unsaturated dibasic acids, condensation of aldehyde etc. he has shown himself an excellent investigator. For a long number of years he has been one of the editors of the Annalen der Chemie. As a lecturer and teacher he was a source of inspiration to his students.

This brief sketch deserves to be supplemented by some of his own words in which he told the participants of the "Richtfest der Benzoltheorie" how he arrived at some of his theories. Inasmuch as many of the passages would lose much of their charm, when translated, the following abstract is given in the original.

"Während meines Aufenthaltes in London wohnte ich längere Zeit in Claphamroad in der Nähe der Commons. Die Abende aber verbrachte ich vielfach bei meinem Freund Hugo Müller in Islington, dem entgegengesetzten Ende der Riesenstadt. Wir sprachen da von mancherlei, am meisten aber von meiner lieben Chemie. An einem schönen Sommertage fuhr ich wieder einmal mit dem letzten Omnibus durch die zu dieser Zeit öden Strassen der sonst so belebten Weltstadt; "outside", auf dem Dach des Omnibus, wie immer. Ich versank in Träumereien. Da gaukelten vor meinen Augen die Atome. Ich hatte sie immer in Bewegung gesehen, jene kleinen Wesen, aber es war mir nie gelungen, die Art ihrer Bewegung zu erlauschen. Heute sah ich, wie vielfach zwei kleinere sich zu Pärchen zusammenfügten; wie grössere zwei kleine umfassten, noch grössere drei und selbst vier der kleinen festhielten, und wie sich Alles in wirbelndem Reigen drehte. Ich sah, wie grössere eine Reihe bildeten und nur an den Enden der Kette noch kleinere mitschleppten. Ich sah, was Altmeister Kopp, mein hochverehrter Lehrer und Freund, in seiner 'Molecularwelt' uns in so reizender Weise schilderte; aber ich sah es lange vor ihm. Der Ruf des Conducteurs: "Claphamroad' erweckte mich aus meinen Träumereien, aber ich verbrachte einen Theil der Nacht, um wenigstens Skizzen jener Traumgebilde zu Papier zu bringen. So entstand die Structurtheorie.

"Aehnlich ging es mit der Benzoltheorie. Während meines Aufenthaltes in Gent in Belgien bewohnte ich elegante Junggesellenzimmer in der Hauptstrasse. Mein Arbeitszimmer aber lag nach einer Seitengasse und hatte während des Tages kein Licht. Für den Chemiker, der die Tagesstunden im Laboratorium verbringt, war dies kein Nachtheil. Da sass ich und schrieb an meinem Lehrbuch; aber es ging nicht recht; mein Geist war bei anderen Dingen. Ich drehte den Stuhl nach dem Kamin und versank in Halbschlaf. Wieder gaukelten die Atome vor meinen Augen. Kleinere Gruppen hielten sich diesmal bescheiden im Hintergrund. Mein geistiges Auge, durch wiederholte Gesichte ähnlicher Art geschärft, unterschied jetzt grössere Gebilde von manigfacher Gestaltung. Lange Reihen, vielfach dichter zusammengefügt; Alles in Bewegung, schlangenartig sich windend und drehend. Und siehe, was war das? Eine der Schlangen erfasste den eigenen Schwanz und hönisch wirbelte das Gebilde vor meinen Augen. Wie durch einen Blitzstrahl erwachte ich; auch diesmal verbrachte ich den Rest der Nacht, um die Consequenzen der Hypothese auszuarbeiten.

"Lernen wir träumen, meine Herren, dann finden wir vielleicht die Wahrheit:

'Und wer nicht denkt,
Dem wird sie geschenkt,
Er hat sie ohne Sorgen'—

aber hüten wir uns, unsere Träume zu veröffentlichen, ehe sie durch den wachenden Verstand geprüft worden sind.

"Ich habe Ihnen vorhin gesagt: zu gewissen Zeiten liegen gewisse Ideen in der Luft. Wir hören jetzt von Liebig, dass es die Keime von Ideen sind, die, ähnlich den Bacillenkeimen, die Atmosphäre erfüllen. Warum fanden nun die vor 25 Jahren umherschwirrenden Keime der Structur- und Benzol-Idee gerade in meinem Kopf den für ihre Entwickelung geeigneten Nährboden? Ich muss Sie wieder mit Mittheilungen aus meinem Leben belästigen.

"Auf dem Gymnasium meiner Vaterstadt hatte ich mich namentlich in Mathematik und in der Kunst des Zeichnens hervorgethan. Mein Vater, mit berühmten Architecten enge befreundet, bestimmte mich für das Studium der Architectur. Ueber die Lebensrichtung der Söhne entscheiden ja meistens die Eltern. Ich bezog also die Universität als studiosus architecturæ und betrieb, unter Ritgen's Leitung, mit anerkennenswerthem Fleiss descriptive Geometrie, Perspective, Schattenlehre, Steinschnitt und andere schöne Dinge. Aber Liebig's Vorlesungen verführten mich zur Chemie und ich beschloss umzusatteln. Da meine Verwandten mir Bedenkzeit auferlegten, verbrachte ich ein Semester auf dem Polytechnikum in Darmstadt. So ist auch die Legende entstanden, ich sei Realschüler, was ich übrigens in keiner Weise für entehrend halten würde. Erst jetzt durfte ich, unter Will's und Liebig's Leitung, mich mit meiner lieben Chemie beschäftigen.

"Schon meine Lehrjahre führten mich nach Paris. Hier konnte ich eben noch den Vorlesungen des berühmten Dumas beiwohnen; ich glaube, es waren die letzten. Ich verkehrte viel mit Wurtz, mit dem mich später die Bande wahrer Freundschaft verknüpften. Ich machte durch Zufall die Bekanntschaft und erwarb mir die Freundschaft von Gerhardt, der in jener Zeit gerade die wasserfreien Säuren entdeckte und das schon fertig vorliegende Manuscript seines berühmten Lehrbuches zum Druck vorbereitete. Ein anderthalbjähriger Aufenthalt auf einem einsamen Schloss in der Schweiz gab mir reichlich Musse, das, was ich durch Einblick in jenes noch nicht veröffentlichte Manuscript gelernt hatte, selbstständig zu verarbeiten.

"Meine Wanderjahre führten mich weiter nach London. Hatte ich in Paris Gelegenheit gehabt, die noch nicht veröffentlichten Ansichten Gerhardt's kennen zu lernen, so war mir jetzt das Glück beschieden, in regem Freundesverkehr mit Williamson mich mit der Denkweise dieses philosophischen Geistes vertraut zu machen.

"Ursprünglich Schüler von Liebig, war ich zum Schüler von Dumas, Gerhardt und Williamson geworden; ich gehörte keiner Schule mehr an.

"Dieser Umstand und die Richtung, welche die früheren architectonischen Studien meinem Geist gegeben, erzeugten ein unwiderstehliches Bedürfniss nach Anschaulichkeit; sie sind offenbar die Ursache davon, dass jene vor 25 Jahren in der Luft umherschwirrenden chemischen Ideenkeime gerade in meinem Kopf den für sie geeigneten Boden fanden. Der Mensch ist eben ein Ausdruck der Verhältnisse, in denen er gross geworden; ein besonderes Verdienst erwächst ihm daraus nicht.

"Darf ich für jüngere Fachgenossen eine Lehre anknüpfen? Machen Sie sich frei vom Geist der Schule, dann werden Sie fähig sein, Eigenes zu leisten. Bedenken Sie dabei, dass es Mephisto war, der dem Schüler den Rath gab:

Am besten ist's auch hier,
Wenn Ihr nur Einen hört
Und auf des Meisters Worte schwört."

Personals.

The honorary degree of L. L. D. was conferred upon Dr. Prescott by the University of Michigan at the last commencement, June 25. At the same time the honorary degree of Bachelor of Science in Pharmacy was conferred upon Prof. L. E. Sayre, Dean of the Kansas University School of Pharmacy.

Prof. H. H. Rusby has returned from his trip to Venezuela.

Mr. Frederick Stearns was presented with a medal by the Detroit Art Institute in recognition of his valuable services to that institution. He is now on his way to South America as a representative of the National Association of Manufacturers.

Professor Charles A. Doremus of New York has been appointed by Secretary Olney to represent the United States Government at the Congress of Applied Chemistry, which met in Paris during the past month.

Mr. J. O. Schlotterbeck, for a number of years instructor in botany and pharmacognosy at the University of Michigan, who has been during the past year in Bern, Switzerland, studying with Prof. Tschirch, is about to return to America.

Dr. Charles F. Chandler, Professor of Chemistry in the Columbia School of mines, New York, also in the New York College of Pharmacy, has completely recovered from an attack of appendicitis, which prostrated him several months.

Dr. Frederick B. Power, formerly in charge of the Department of Pharmacy at the University of Wisconsin, in Madison, and for four years scientific director of the laboratories of Fritzsche Bros. at Passaic, N. J., was tendered a banquet in London on the evening of July 21, on his appointment as director of the Wellcome Research Laboratories. Professors Brunton, Moulton, Hughes, formerly a resident in the United States, and Meldola were among those present.

Commercial.

R. Schuchardt of Triest reports that the 1896 crop of insect flowers both in Dalmatia and Montenegro is slight. The plants have suffered from an insect similar to the *Phylloxera*. The result has been that large districts which formerly yielded large quantities of insect flowers, have this year been under tobacco cultivation. The collectors, therefore, demand ridiculously high prices and are not at all anxious to sell, hoping for better prices still.

Catalogues received:—

E. R. Squibb & Sons. Semi Annual price list of standard pharmaceutical preparations and pharmaceutical reagents. July 1896.

Max Kohl, Chemnitz. Nachtrag zur Preisliste No. 10. Physikalische Apparate.

SUPPLEMENT, SEPTEMBER 1896.

Universities and Colleges.

University of Illinois.

On Aug. 16, the chemical laboratory building of the University of Illinois, at Champaign was almost destroyed by fire. The damage to the building is estimated at $20,000 and to the contents at $50,000. The department will be in working order by the opening of the school year.

Massachusetts College of Pharmacy.

In addition to the older course a new course covering two academic years and modelled after the two years' course of the University of Michigan will be offered. The degree to be awarded is that of Ph. C. No practical experience will be required.

University of Chicago.

The corner stone of the Hull Biological Laboratory of The University of Chicago was laid July 3d, with appropriate ceremonies. An address was delivered by Dr. George L. Goodale, of Harvard University, upon "Some of the relations of the new natural history to modern thought and modern life," in which the speaker made a strong statement concerning the claims of biology to a place in educational schemes and also upon the community. Head Professor John M. Coulter officiated at the laying of the corner stone of the Botanical Hall and made a brief statement concerning the purposes of the building. In the evening the visiting biologists were entertained by The University at the Quadrangle Club House, where informal responses were called for by President Harper. Among the visiting botanists present were: Dr. Geo. L. Goodale, Harvard University; Dr. T. J. Burrill, University of Illinois; Dr. T. H. MacBride, University of Iowa; Dr. Charles R. Barnes, University of Wisconsin; Dr. G. F. Pierce, University of Indiana; Dr. C. F. Millspaugh, Field Columbian Museum. The accompanying cut will give some idea of the external appearance of the building, which will be ready for use in the spring of 1897.

Hull Botanical Laboratory.

Catalogues Received.

Atlanta Medical College—Atlanta, Ga. Annual Announcement. Session 1896—'97.

Baltimore College of Dental Surgery — Baltimore, Md. Fifty-seventh Annual Catalogue, 1896—'97.

Kansas City College of Pharmacy — Kansas City, Mo. Eleventh Annual Annoucement, 1896.

National College of Pharmacy — Washington, D. C. Twenty-fifth Annual Circular, Session of 1896—'97.

Scio College, Department of Pharmacy — Scio, O. Annual Announcement, 1896—1897.

University of Michigan, School of Pharmacy—Ann Arbor, Mich. Annual Announcement and Register of Alumni. Twenty-ninth year, 1896—'97.

Scientific Societies and Organizations.

Verein Deutscher Naturforscher und Aerzte.

The sixty-eighth meeting of the German Naturalists and Physicians will be held in Frankfurt on the Main, Sept. 21—26. Nine sections, representing pure science, pharmacy and medicine, will hold sessions. The programme of the section of Pharmacy and Pharmacognosy includes the names of Dr. Vulpius, of Heidelberg; Dr. A. Schneider, of Dresden; Dr. Kunge-Krause, of Lausanne; Dr. C. Hartwig, of Zürich; and Dr. Homeyer of Frankfurt. Among the general addresses will be one by Dr. J. H. van't Hoff, of Charlottenburg, on The Processes of Slow Oxidation; and one by Dr. E. Beckmann on The Determination of Molecular Weights.

Illinois Pharmaceutical Association.

The seventeenth annual meeting of the Illinois Pharmaceutical Association was held at Springfield July 28 and 29.

Among the most noteworthy points touched upon on the annual address of Pres. Sohrbeck were: satisfaction with the present pharmacy law and the opinion that its more complete enforcement would prove a decided benefit; recommendation of the druggists cooperative manufacturing company organized under the auspices of the Association, as placing a powerful weapon in the hands of the pharmacist with which to defend himself against the inroads of the patent medicine manufacturers; congratulation to the pharmacists of the state upon the acquisition by the State University of the Chicago College of Pharmacy; and the expression of a wish that the members would show their appreciation of this step by promptly responding to the invitation of the University to select an advisory board of pharmacists to assist in the management of the School of Pharmacy.

In accordance with this recommendation the following gentlemen were selected as nominees for the advisory board; Henry Biroth, Blue Island; A. E. Ebert, W. M. Sempill and Andrew Scherer, Chicago; Dr. H. H. Rogers, Kankakee; H. H. Green, Bloomington; Henry Swannell, Champaign; Thos. Knoebel, East St. Louis; Theo. C. Loehr, Carlinville; and Fritz Lueder, Peoria.

The election of officers for the ensuing year resulted as follows:

W. K. Forsyth, Chicago, President; M. B. Travis, Saybrook, 1st Vice Pres; W. H. Garrison, Pearl, 2nd Vice Pres; H. H. Sawyer, Rockford, 3rd Vice Pres; T. S. Arnold, Watseka, Treasurer; Frank Fleury, Springfield, Secretary.

An invitation to the Association from the President of the University to meet at Champaign next year was accepted and June 15 and 16 were the dates fixed for the meeting.

Missouri Botanical Garden.

The recent tornado at St. Louis was so destructive that much anxiety was felt by botanists as to the fate of the Missouri Botanical Garden. In the absence of Dr. Trelease, Mr. C. H. Thompson, Acting Director, has furnished the following statement to the editor of the Botanical Gazette:

"The Garden was in the direct path of the storm, at the very beginning of the territory destroyed, and received less injuries than the region east of us. However, the damage done in the Garden is very considerable, the most of it being in the arboretum, where something like 160 trees were either uprooted or broken off near the ground, so that they had to be taken out. These, of course, were total losses. Something over 250 were badly damaged. In many cases the tops of the trees were almost entirely carried away. Many of these, by judicious pruning, will in a few years grow to be beautiful trees again, while many are so badly broken that it is probable that they will die. The shrubbery was badly whipped and broken, but fared better than the trees. The bed plants were almost totally destroyed in the exposed parts of the grounds. However, these are now replaced. The wreckage from the trees is rapidly being gathered up, and the Garden promises by another month to be as beautiful as ever, with only the vacant places here and there to remind us of the ravages of the storm.

Buildings suffered somewhat. The Linnean house, which shelters the palms in the winter season, had the glass portion of the roof entirely demolished. The office building had the tin roof torn from the south wing, and other buildings escaped with slight damages. At the office building, where the library and herbarium are kept, no damage whatever was done to the contents of the building. No permanent damage was done to the Garden, and most of it can be repaired in a short time."

Biology and the Dept. of Agriculture.

The following editorial from the July number of the Botanical Gazette is of interest and calls for no comment.

"The establishment of a biological survey by the Department of Agriculture, under a recent act of Congress, should mark the beginning of a new era in the botanical field-work of the United States. Some work of this kind has been done by the general government, and by different institutions, but it has been desultory and without any general plan. At the head of the new survey no more competent man could have been placed than Dr. Merriam, for his whole work has tended in this direction and his publications have shown a wide grasp of the problems. To be made most effective, large cooperation must be obtained from local organizations, which will work along definite lines in a general plan. The natural allies of the Department will be the Experimental Stations already established in every state, but even these should not be regarded as adequate. Where state biological surveys are organized, these should be associated with the government survey and work under its general direction; and where they are not, such organizations should be formed, or the biologists of the state should individually associate themselves with the general survey. There can be no doubt that abundant and important service can be suggested to every worker by Dr. Merriam. The new survey should prove a great stimulus to the coming generation of botanists, and to the strong movement in botany which is impelling them to emerge from herbaria and laboratories and to come in contact with the larger problems of plant-life. The gradual shifting of the botanical standpoint is becoming daily more evident, and the period of morphology is merging into one to be dominated by physiology, not merely the chemistry and physics of physiology, but the larger field of ecology.

"The movement for the appointment of a scientific chief of the department of agriculture seems to have received a check, whether through its friends or enemies we are not informed. But as it has received already the cordial endorsement of a considerable number of the foremost scientific men and societies, it is to be hoped that it will yet be carried to success. What may be the condition in other lines of scientific work we do not know, but we do know that under the present division of labor in botany there is a dissipation of energy and a duplication of work that might be largely avoided under a more logical and consistent organization, such as could probably be secured by a wise and broad-minded scientific executive. Now that the head of the department holds a cabinet portfolio, it is out of the question to expect other than a political adviser of the President to be appointed. If under him there were a permanent chief, empowered to organize and harmonize all the scientific divisions as the president of a university directs its policy in consultation with heads of departments, we should find increased economy and efficiency of every division. Under the present conditions there is a division of botany, a division of agrostology, a division of forestry, and a division of vegetable physiology and pathology. It is needless to point out the absurdity of the naming of these divisions, which have been split off one by one from the original division of botany. Each now is wholly independent of the other in control, appropriations, quarters and equipment. There is a force of live young men in these divisions and a very great amount of work is done, on whose high quality we have had occasion frequently to comment. There should be a chief of the division of botany, with general direction of all botanical work; the present "division of botany should be rechristened, while it and the other botanical divisions should be made sections, each in charge of an assistant chief. This would make it possible to concentrate the office and routine work so that each chief would be left freer to push the work of his section. There can be no doubt that under some such plan we should see even more important advances in pure and applied botany than have been possible under the present system."

American Pharmaceutical Association.

The following skeleton report of the sessions of the Montreal meeting, held Aug. 12th to 18th at the Windsor Hotel, may serve as supplement to the editorial on the the first page of this number.

First General Session, Wednesday afternoon. The association was called to order by President Good of St. Louis. He introduced Mr. R. W. Williams, president of the Quebec Pharmaceutical Association, and Mr. W. H. Chapman, president of the Montreal College of Pharmacy, who wellcomed the visitors. Prof. E. L. Patch of Boston accepted for the association. Vice President Charles E. Dohme assuming the chair, President Good delivered his annual address. He commented on the work of the committee on the status of the pharmacist in the U. S. Army and Navy; the committee on the metric system; the National Formulary; the two queries discussed by Dr. Chas. Rice, chairman of the Committee of Revision, at Atlanta;* the question of free alcohol; and the International Pharmaceutical Exhibition to be held at Prague, Austria.

The evening was pleasantly spent in the parlors of the Windsor Hotel, a reception being tendered the visitors by the Pharmaceutical Association of the Province of Quebec and the Montreal College of Pharmacy.

Second General Session, Thursday morning. The report of the nominating committee was received and the persons, whose names were recommended, elected. President, J. E. Morrison, Montreal; first vice-president, G. F. Payne, Atlanta, Ga.; second vice president, W. A. Frost, St. Paul, Minn.; third vice-president, G. W. Parisen, Perth Amboy, N. J.; treasurer, S. A. D. Sheppard, Boston; secretary, Chas. Caspari, Jr., Baltimore; reporter on the progress of pharmacy, C. L. Diehl, Louisville, Ky.; members of council for a three-year term, C. E. Dohme, Baltimore; J. M. Good, St. Louis; J. P. Remington, Philadelphia.

Reports were made by the treasurer, the secretary, the reporter on the progress of pharmacy and the chairmen of various committees.

The short **General Session** was held in the afternoon previous to the session of the commercial section. A detailed report of the committee on national legislation was read.

The **Commercial Section** was then called to order by Chairman Geo. J. Seabury.

The chairman read his address and Mr. E. A. Robinson read the only paper presented to the section. It was an answer to query 8: "Are non recent preparations, in imitation of well-known domestic medicines, legitimate products; and is it honest for a dealer to allow his name to be printed on a label so as to give an unknown compound currency, when he is ignorant of the contents of such preparation? Why does he not prepare his own family and household remedies?"

A report from Mr. Holmes, editor of the Mortar and Pestle, was read explaining the history of this short lived publication of which only four numbers appeared.

The officers elected for the following year are: Chairman, S. C. Hopp, Cleveland, O.; secretary, E. D'Avignon, Windsor, Ont.; associates, G. Mennen, Newark, N. J.; John F. Patton, York, Pa.; W. L. De Woody, Pine Bluff, Ark.

Inasmuch as there was no business for a second session of this section, as scheduled, the members were free to witness the fête nuit at Boucherville.

A **Fourth General Session** was held Friday morning to dispose of several business items. After adjournment the **Scientific Section** was called to order by Chairman S. P. Sadtler, who read his address. This was followed by the reports of committees.

The report of the special committee on indicators used in the volumetric estimation of alkaloids was practically a continuation of last years' report, and evoked considerable discussion.

The report of the Committee on the U. S. P. was merely read at this meeting.

The report of the committee on special research was received and steps were taken to assure for it greater permanency and usefulness.

The afternoon being given over to sightseing, viz. an electric car-ride through Montreal and its suburbs, the second session of the **Scientific Section** was not called until the evening. The following officers were then elected: Chairman, W. C. Alpers, Bayonne, N. J.;

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* 1. Shall a table of average doses of drugs and preparations be given in the Eight Decennial Revision of the U. S. Pharmacopœa?
2. Shall a selected list of new, synthetic remedies be introduced into the same work?

secretary, Virgil Coblentz, N. Y.; associates to be selected by these gentlemen.

The report of the committee on the U. S. P. was now taken up in detail and discussed freely. A large number of recommendations were referred to the committee on special research, others to the section of Materia Medica and Pharmacy of the Am. Med. Ass'n. for joint consideration by both professions.

The first paper read was that on "The caffeine compound in kola" by J. W. T. Knox and A. B. Prescott; the second that on "Taraxacin" by L. E. Sayre.

Recess was then taken until the following morning, when a paper on "Poisonous Honey" was read by L. F. Kebler. The first session was then adjourned.

The **Fifth General Session** was quickly disposed of Saturday morning.

The third session of **Scientific Section** was then called to order. The following papers were read:

"Canada potash", by T. H. Reed.

"Gelatine capsules", by W. C. Alpers.

"The destructive distillation of linseed oil", by S. P. Sadtler.

"Mixtures of solids for internal use", by C. S. N. Hallberg.

"Alcohol as a source of error in the titration of alkaloids", by Chas. Caspari, Jr.

"History and names of *Rhamnus Purshiana*", by J. U. Lloyd.

"Strophanthus seeds", by S. E. Jelliffe.

"The Menthol Group, IV",
"*Monarda punctata*",
"*Monarda fistulosa*", by Edward Kremers.

"Products of the U. S. P.", by C. T. P. Fennel.

"Valuation of wild cherry bark", by A. B. Stevens.

"Antitoxine", by H. K. Mulford.

"What is the nature of dietetics employed in modern medicine and pharmacy", by F. E. Stewart.

* "Antitoxine", by C. T. McClintock.

* "Salol in salicylic acid", by Fr. Hoffmann.

* "Determination of phosphoric acid in soluble ferric phosphate, U. S. P.", by W. A. Puckner and F. Julian.

* "Pepsin", by C. C. Sherrard and J. S. Tegarden.

* "Pepsin standard of the U.S.P.", by C. C. Sherrand.

The **Section on Education and Legislation** held its first session Saturday afternoon. Chairman C. S. N. Hallberg read his annual address and secretary Beal his report. Papers concerning the character of state board examinations were read by H. B. Mason, C. S. N. Hallberg and H. M. Whelpley. The afternoon was spent in a lively discussion of these papers.

The second session of this section was called to order in the evening. The present officers were reelected. The following papers were read:

"Duty pharmacists owe to their unregistered apprentices", by G. M. Whelpley.

"To what extent should a candidate for registration in pharmacy be required to be familiar with the subjects of microscopy and volumetric analysis", by T. H. Reed.

"A comparative exhibit of poison and pharmacy laws in the United States", by J. H. Beal.

"Oddities in pharmacy laws", by J. H. Beal.

"Is the sale of liquor by druggists necessary or should it be prohibited", by H. M. Whitney.

"Practice versus theory", by S. P. Watson.

Several other papers were read by title or in abstract. The section adjourned without holding third session as scheduled per programme.

Sunday was devoted to rest and Monday to a trip through the Lachine Canal, Lake St. Louis and the Lachine Rapids. The final **General Session** was held Tuesday morning and the usual routine of general business was disposed of.

Calendar of Boards of Pharmacy.

State and Territory.	Place of Next Meeting.	Date of Next Meeting.	Name and Address of Secretary.
California	San Francisco	Oct. 14.....	John H. Dawson, San Francisco.
Kansas	Emporia........	Sept. 9......	W. C. Johnston, Manhattan.
Massachusetts....	Boston	Oct. 6.......	F. H. Butler, Lowell.
Minnesota	Minneapolis ..	Oct. 6.......	H. G. Webster, Minneapolis.
Missouri	St. Louis.......	Oct. 12.....	F. W. Sennewald, St. Louis.
Montana	Great Falls....	Oct. 7.......	G. W. Shoenecker, Billings.
Ohio..................	Cleveland	Oct. 13.....	W. R. Ogier, Columbus.
Oklahoma..........	Oklahoma City.	Oct. 6.......	E. E. Howendobler Perry.
Rhode Island......	Providence	Oct. 5.......	W. E. Cates, Providence.
South Dakota.....	Huron	Oct. 14.....	I. E. Kiethe, Lake Preston.
Washington........	Spokane	Sept. 21....	W. H. T. Barnes, Seattle

Bibliography.

With the July number, the first of the twenty-second volume, the *Botanical Gazette* appears in its new form. The size has been increased to about eighty pages and other improvements in dress give the page a somewhat luxurious air. The three editors, Professors J. M. Coulter, C. R. Barnes and J. C. Arthur have enlisted the co-operation as associate editors of Prof. George T. Atkinson of Cornell University, Prof. Volney M. Spalding of the University of Michigan, Prof. Roland Thaxter of Harvard University and Prof. Wm. Trelease of Missouri Botanical Garden. The *Gazette*, while financially supported by the University of Chicago, as is evident by its changed appearance, is in no way the organ of that University or of any other, a situation guaranteed by the number and distribution of its editorial staff.

The Scientific American celebrated its semi-centennial by putting forth a special 72-page number. This issue is devoted mainly to the presentation of the advance in science and invention during the last fifty years. The historical articles on particular inventions, such as the sewing machine, the phonograph, the telephone, the reaper, the bicycle, etc., are valuable sources of information, and are illustrated with cuts of great interest. Attempts to sum up the progress of sciences like physics and chemistry in the limits of a two-column article are necessarily less successful, but may perhaps be of some value to a casual reader. Among other special features is a prize essay on The Progress of Invention for the Last Fifty Years, by Edward M. Byrne, A. M. The mechanical work on the Scientific American is always excellent, and this number is no exception.

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* Read by title.

SUPPLEMENT, OCTOBER 1896.

Universities and Colleges.

University of Goettingen.

The Institute for Physical Chemistry and Electrochemistry was dedicated June 7, of this year. It is the first of its kind connected with a German university and is placed in charge of Prof. Nernst, who began to lecture on physical chemistry in the capacity of a Privat-docent at the university in 1890. Under Prof. Nernst's directions this department has undergone a most remarkable development so that Goettingen precedes even Leibzig in a special institute for physical chemistry.

University of Munich.

The new pharmaceutical institute and laboratory for applied chemistry will be opened the coming winter semester under the direction of Prof. Hilger. The new building located in the botanical garden near the chemical institute is supplied with all modern conveniences and laboratory appliances. The institute is also in direct communication with the botanical institute and the royal experiment station for food stuffs and beverages is located in the same building.

Catalogues Received.

Buffalo College of Pharmacy — Buffalo, N. Y. Eleventh Annual Announcement, 1896—'97.

Philadelphia Polyclinic and College for Graduates in Medicine. Announcement for 1896—'97.

St. Louis College of Pharmacy — St. Louis, Mo. Thirty-first Annual Session from Oct. 5, 1896, to April 9, 1897.

Calendar of Boards of Pharmacy.

State and Territory.	Place of Next Meeting.	Date of Next Meeting.	Name and Address of Secretary.
California	San Francisco	Oct. 14	John H. Dawson, San Francisco.
Maine	Portland	Oct. 14	F. P. Partridge, Augusta.
Massachusetts	Boston	Oct. 6	F. H. Butler, Lowell.
Minnesota	Minneapolis	Oct. 6	H. G. Webster, Minneapolis.
Mississippi	Jackson	Oct. 6	G. L. Moore, Jackson.
Missouri	St. Louis	Oct. 12	F. W. Sennewald, St. Louis.
Montana	Great Falls	Oct. 7	G. W. Shoenecker, Billings.
New Hampshire	Concord	Oct. 26	G. F. Underhill, Concord.
New Jersey	Trenton	Oct. 15	A. S. Elwell, Bridgeton.
Ohio	Cleveland	Oct. 13	W. R. Ogier, Columbus.
Oklahoma	Oklahoma City.	Oct. 6	E. E. Howendobler Perry.
Rhode Island	Providence	Oct. 5	W. E. Cates, Providence.
South Dakota	Huron	Oct. 14	I. E. Kiethe, Lake Preston.
Tennessee	Memphis	Oct. 14	J. O. Burge, Nashville.
Wisconsin	Ashland	Oct. 21	E. B. Heimstreet, Janesville.

Scientific Societies.

Am. Assn. for the Advancement of Science.

The chemical section, of which W. A. Noyes of Terre Haute, Ind., and F. P. Venable, Chapel Hill, N. C., were chairman and secretary respectively had a long list of papers which were grouped under the following heads, each group being lead by the gentleman, whose name accompanies that of the group: —

Physical Chemistry — Dr. A. A. Noyes.

Inorganic Chemistry — Prof. F. W. Clarke of Washington.

Organic Chemistry — Prof. P. C. Treer of Ann Arbor.

Didactic Chemistry — Prof. J. L. Howe of Washington and Lee University.

Analytical Chemistry — Prof. E. D. Campbell, Ann Arbor.

Technical Chemistry — Dr. Wm. McMurtrie, New York.

Sanitary Chemistry — W. P. Mason, Rensselaer Polyt. Inst.

Agricultural Chemistry — Dr. L. L. Van Slyke, Geneva, N. Y.

Biological Chemistry — Dr. E. A. de Schweinitz, Washington.

Aside from the papers of didactic interest the following may be mentioned as being of special interest to the pharmaceutical chemist: —

G. B. Frankforter, Univ. of Minn.

1) A complete analysis of *Phytolacca decandra*.
2) The crystallized salts of *P. dec.*
3) The by-products formed in the conversion of narcotine into narceine.

J. L. Howe, Wash. and Lee University. — Notes on Reinsch's test for arsenic and antimony.

E. A. de Schweinitz, Washington — Value and use of formaldehyde as a disinfectant.

V. K. Chestnut, U. S. Dept. of Agr. — Andrometoxin, the poisonous constituent of the *Ericaceae* and its relation to some food products.

L. Kahlenberg and R. H. True, Madison, Wisconsin. The toxic action of dissolved salts and their electrolytic dissociation.

The officers elected by the section for the following year are W. P. Mason of Troy, N. Y., chairman, and P. C. Freer of Ann Arbor, Mich., secretary.

Association of French Pharmacists.

The general session of the Association des Pharmaciens de France was held in Rouen during the month of August. Pharmaceutical specialties with the cutting of prices seem to threaten the French pharmacist as they have become the bane of the American druggist.

As in Germany the druggist comes into unfair competition with the pharmacist, so in France the herbarist. This is particularly true in the larger cities. Legislation to remedy the evil by defining more closely what the herbarests may sell and what not was discussed, but no definite action was taken.

The question of more college education and less apprentice-ship, as suggested by the government, is also agitating French pharmacists at present.

Swiss Pharmaceutical Society.

The fifty-second annual session of the Schweizerische Apothekerverein was held Aug. 12th and 13th in Freiburg and Murten. In the president's address the method according to which new remedies are introduced by manufacturers was sharply criticized. President Keller also emphasized the need of examining all drugs and preparations. As inspector he had found in a single drug-store (as opposed to pharmacy) 76 forbidden drugs and medicaments. The alcohol question was also discussed. This seems to show that much the same questions agitate pharmacy the world over.

Bibliography.

A second supplement to the Belgian Pharmacopœia has recently been issued. It treats exclusively of diphtheria serum and contains regulations as to how this important remedy is to be kept.

Number 34 of the Centralhalle, called "Fest-Nummer" in honor of the 25th general session of the German Apothecaries Society, is particularly rich in original contribution.

Das Institut für Physikalische Chemie und besonders Elektrochemie an der Universität Göttingen, is a "Festschrift" written by Prof. Nernst in commemoration of the dedication of the first institute for physical chemistry at a German university, has been published by Wilhelm Knapp, Halle a. S.

Volume one of An Illustrated Flora of the Northern States and Canada has just been issued. It is the first complete illustrated manual of botany published in this country and is intended for students and lovers of plants. The work, which will be complete in three volumes containing over 400 cuts, is edited by Prof. N. S. Britton and Hon. Addison Brown, with the assistance of specialists in various groups and is published by Chas. Scribner's Sons.

The 21st edition, with appendix, of Dunglison's Dictionary is announced as beeing "just ready" by Lea Brothers & Co. It is a dictionary of medical science containing a full explanation of the various subjects and terms of anatomy, physiology, medical chemistry, pharmacy, pharmacology, therapeutics, medicine, hygiene, dietetics, pathology, surgery, ophthalmology, otology, laryngology, dermatology, gynecology, obstetrics, pediatrics, medical jurisprudence and dentistry, etc., etc.

Ferdinand Enke of Stuttgart announces the completion of the third volume of Dammer's Handbuch der chemischen Technologie, which contains the chapters on fats and oils, lubricants, soaps, fatty acids, glycerin, volatile oils, resins and balsams, wood, paper, carbohydrates, starch, dextrin, bread, glucose, cane sugar, alcohol, vinegar, beer and wine.

C. W. Kreidel's Verlag in Wiesbaden announces the completion of Naturwissenschaftliche Einführung in die Bacteriology, by Dr. Ferdinand Hueppe.

In their September Bulletin Ginn and Company call attention to the following recent and forthcoming publications in chemistry:

Chemical Experiments (reviewed on p. 119 of this journal).

Indroduction to Chemical Science (revised edition ready this winter).

Laboratory Manual of General Chemistry (revised edition ready this fall). By R. P. Williams of the English High School, Boston.

An Elementary Chemistry. By Geo. R. White, instructor in chemistry at Phillips Academy, Exeter, N. H.

Longmans, Green & Co., N. Y., announce as just published Newth's Elementary Practical Chemistry for beginners, and Watson's Elementary Practical Physics, both laboratory manuals for beginners.

A new edition of Duane's Students' Medical Dictionary has also been completed. The demand for this work has not only made necessary the issuance of another edition, but has also made possible a reduction in the price, varying according to style of binding from $3.00 to $3.75. The same publishers also announce the completion of a new (3d) and enlarged edition of Vaughan & Novy's work on Ptomains, Leucomains, Toxins and Antitoxins.

Catalogues received: —

Macmillan & Co. — N. Y. Works on Chemistry.

P. Blakiston, Son & Co. — Philadelphia. A Portrait Catalogue of Books on Medicine, Dentistry, Pharmacy, Chemistry, Microscopy, Hygiene, Nursing and Allied Subjects.

Ginn & Company — Boston. Bulletin of recent and forthcoming publications in Natural Science and History. Sept. 1896.

J. B. Lippincott Company—Philadelphia. Autumn Announcement of new and forthcoming publications. 1896—'97.

Longmans, Green & Co. — New York. September Bulletin.

History.

Justus v. Liebig.

The following interesting sketch of Liebig as a teacher is taken from a lenghty review of Carl Vogt's: Aus meinem Leben, Erinnerungen und Rückblicke,* in a recent number of Gaea. Referring to his teacher of chemistry Vogt writes:

"Dieser stand damals in der Blüthe seiner Kraft und seines Eifers und man hörte ihm bei jedem Worte an, dass es ihm daran gelegen sei, uns gründlich zu belehren. Die Vorlesungen waren freilich keine Muster, weder was die Direktive, noch was die Ausführung der zahlreichen Experimente oder die Deduktion der Schlüsse und

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* Verlag von Erin Naegele, Stuttgart. 1896.

Folgerungen betraf. Liebig überhastete sich damals noch in allem; er liess stets die Mittelglieder einer logischen Folgerung aus und sprang von dem Vordersatze gleich mit beiden Füssen in den Schlusssatz hinein. Bei den Versuchen vergriff er sich regelmässig und ein Experiment gelang nur dann, wenn ihm die Assistenten links und rechts die Instrumente und Reagentien in die Hand gaben. So vortrefflich er im Laboratorium manipulirte, so schlecht gelang es ihm in der Vorlesung; aber trotz dieser Mängel fasste man Feuer für die Sache und ward hingerissen. "Meine Herren, hier in diesem Reagenzglase habe ich eine Flüssigkeit. Es ist eine Auflösung von essigsaurem Bleioxyd in Wasser. Sie könnten glauben, es sei Wasser — es sieht ganz aus wie Wasser — aber ich könnte Ihnen beweisen, dass es eine Auflösung ist — einstweilen müssen Sie mir das aufs Wort glauben. Also, dieses Wasser, es ist eine Auflösung von essigsaurem Bleioxyd! — Hier, in diesem Gläschen, sehen Sie, eine gelbe Flüssigkeit! (Hält das Gläschen vors Auge.) Richtig! Eine gelbe Flüssigkeit! Diese gelbe Flüssigkeit, sie ist eine Auflösung von chromsaurem Kali in Wasser." (Er stellt die beiden Gläser hin, geht an die Tafel und schreibt mit der Kreide)

Ac. — PlO — Essigsaures Bleioxid

CrO—KaO — Chromsaures Kali.

"Es ist einerlei, ob ich die Atomzahlen hinzusetze, das verstehen Sie noch nicht. Aber Sie verstehen, dass dieses essigsaures Bleioxyd und dieses chromsaures Kali ist. Nun, meine Herren, giesse ich die beiden Flüssigkeiten zusammen. (Er giesst sie zusammen, geht an die Tafel und macht einen Kreuzstrich.) Sie sehen, es geschieht eine Zersetzung. Die Essigsäure geht an das Kali und bildet essigsaures Kali, das im Wasser löslich und farblos ist; die Chromsäure geht an das Bleioxyd und bildet chromsaures Bleioxyd, das im Wasser unlöslich ist und einen schönen, gelben Niederschlag bildet, der als Farbe, als Chromgelb, gebraucht wird." (Er schüttelt das Glas, geht, dasselbe beständg schüttelnd, an der vorderen Reihe der Studenten auf und ab, stets wiederholend: "Chromgelb! Ein schöner, gelber Niederschlag! Sie sehen, meine Herren, Sie sehen!") Endlich hält er sich selbst das Glas vor das Auge. "Das heisst, Sie sehen nichts, denn der Versuch ist missglückt!" (Er schmeisst wüthend das Glas in eine Ecke.) Ettling, der Assistent, zuckt schweigend die Achseln und deutet auf ein Glas, das noch auf dem Tische steht, um den Studenten zu sagen: der Professor hat sich wieder einmal in seinem Eifer vergriffen.

Am Ende der ersten Woche kündigte Liebig an, dass er von nun an allwöchentlich am Samstag Nachmittag ein Examinatorium halten werde, zu welchem er alle einlade, die ernstliches Interesse an der Chemie nähmen. Beim ersten Examinatorium war der Hörsaal voll. Er examinirt sehr scharf, ging auf den Grund der Dinge ein und liess diejenigen, welche nicht zu antworten wussten, mit offenen Mäulern sitzen. Beim zweiten Examinatorium waren ausser denjenigen, die im Laboratorium arbeiteten, nur etwa 20 vorhanden; beim dritten erschienen die Laboranten nicht—wir waren fünf Mann! Liebig lächelte schlau und sagte: "Nun, die Spreu hat sich von dem Weizen getrennt! Wir werden das Examinatorium nicht weiter fortsetzen, meine Herren! Aber da ich sehe, dass Sie ein ernsthaftes Interesse an der Wissenschaft nehmen, so lade ich Sie ein, in mein Laboratorium zu kommen. Sie sollen dort Ihre Plätze haben. Wählen Sie sich nach Massgabe Ihrer anderen Vorlesungen die Wochentage und Stunden aus, wo Sie in dem Laboratorium arbeiten wollen. Mein Assistent, Herr Ettling, wird Ihnen die nöthigen Instruktionen geben und Ihnen bei Ihren ersten Arbeiten behilflich sein."

In Memoriam.

Hermann A. T. Mueller.

On the 15th of August Hermann Alexander Theobald Mueller, the founder and publisher of the Pharmaceutische Zeitung died at his home in Bunzlau, Prussian Selicia. He was born May 8th, 1828 in Rondten, Silecia, as the son of the secretary of the circuit court. After he had obtained necessary preliminary education, he in 1845 entered the pharmacy of Hanke in Winzig as apprentice; passed the assistant's examination in 1848; served his time as assistant in Silecia and on the Rhine; studied in Berlin during the years 1852—53 and passed the final state-board examination. He then entered Wolf's pharmacy in Bunzlau and here in the capacity of an assistant founded the Pharmaceutische Zeitung, the first number of which appeared April 5th, 1856.

In the establishment of this paper Mueller revealed a far-reaching insight into the practical needs of the German pharmacist. In addition to the scientific periodicals the practicing pharmacist wanted a professional paper, which supplied reports of current events and discussed questions of a professional nature, served the purpose of an exchange etc. In this the Pharmaceutische Zeitung was a pioneer. It was for some years published weekly, and is now issued semi-weekly. It filled a want and naturally was successful. Until 1869 he was sole editor, but at that time associated with himself the present editor Dr. H. J. Boettger.* Mr. Mueller not only served German pharmacy as editor of his journal, but was a live member of the Apothekerverein and for a number of years the Pharmaceutische Zeitung was the official organ of the German Apothecaries Society until 1886, when the society established its own journal. At this time the Pharmaceutische Zeitung was removed to Berlin and since then has been published by the large firm of Julius Springer. Mr. Mueller, however, did not follow his journal, but gave his time and attention to public matters, serving in various capacities.

Personals.

Dr. A. Kanitz, Professor of Botany at the University of Klausenburg is dead.

Prof. Wm. Trelease, Director of the Missouri Botanical Garden, has recently returned from Madeira.

Dr. Friedr. Simony, the well known naturalist, originally a pharmacist, died July 20, at St. Gallen, Steiermark.

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* [See Pharm. Rundsch. 12, p. 5.]

The first gold medal of the London Society of Chemical Research was conferred on Mr. John Glover, inventor of the Glover tower.

Sir. Robert Grow, inventor of the voltaic cell that bears his name, died in London, Aug. 2. He was a lawyer by profession, and turned his attention to electricity as a recreation in time of ill health.

The well known pharmacologist, Prof. Dr. Hofmeister of the University of Prague, has received a call to Strassburg as successor of Hoppe Sieler in physiological chemistry.

On the twentieth anniversary of the opening of the Imperial Office of Health in Jena, the University of that city conferred the degree of M. D. upon Prince Bismarck. Bismarck had already received all other doctor's degrees in the gift of the university.

Edward B. Sternes, M. D., died at his home in Lebanon, O., July 11. He had held the chair of Materia Medica in Miami Medical College and the University of Syracuse, and was for seventeen years editor of the Lancet and Observer, afterward of the Obstetric Gazette.

From an endowment made in honor of the late Professor Flückiger, two stipends for the support of scientific investigation have been granted. Dr. Schlotterbeck of Ann Arbor, Michigan, received one for his study of the "Development of certain official seeds." Dr. Biermann of Holzminden was the recipient of the second for his work on the "Structure, development and comparative anatomy of the citrus fruits." Both stipends are to be used for the preparation of lithographic plates to illustrate the articles mentioned.

On the occasion of the fiftieth anniversary of the appointment of Prof. Dr. Lang as teacher of natural history in the Canton School at Solothurn, Switzerland, the Swiss Apothecaries' Society, of which he is an honorary member, celebrated the event by sending a congratulatory address. Although never a practicing pharmacist, Dr. Lang has been long and prominently identified with the interest of pharmacy. Serving his apprenticeship in Solothurn, with Apotheker Pfähler, the same man with whom Flückiger began his career in pharmacy, he and Flückiger became firm friends holding in common high ideals for pharmacy.

Commercial.

A Twenty-fifth Anniversary.

On the 28th of August of this year the firm of Fritzsche Brothers, of New York, celebrated its twenty-fifth anniversary.

The house was founded Aug. 28, 1871 by Mr. Paul Fritsche, now deceased, and soon became famous as representing the old house of Messrs. Schimmel & Co. of Leipsic, Germany, having correspondents in all parts of the world.

The firm working hand-in-hand with the Leipsic and Prague houses, has, within recent years introduced into the American market many synthetic products, which have been pronounced the acme of modern chemistry. The laboratories at Garfield, N. J., are fitted up with the latest apparatus for manufacturing purposes, as well as for scientific investigation and experiment. The present partners are Mr. Hermann Traugott Fritzsche, and Mr. Ernst Traugott Fritzsche of Leipsic, while the New York branch is represented by the resident partner, Mr. Carl Brucker.

The firm has done much to improve the volatile oil market in this country so that its name has become a house-hold word with American pharmacists for pure products. Those who are interested in pure drugs and chemicals wish the firm even greater prosperity and usefulness in the future than during the past quarter of a century.

According to M. Popkow the demand for Russian medicinal plants has been very great, especially on the part of Hamburg firms, a single firm having purchased about ½ million Kilo. The demand for castor beans has been even greater. The demand for melilot, chamomile, liquorice, valerian, absinth, mustard and unbelliferous fruits has been greater than the supply. Southern Russia and the Caucasus are well adapted for the cultivation of these plants, which must be conducted on a large scale to be renumerative. The land in these districts, however, is largely in the hands of communities who are not willing to rent the same for any great length of time. Considerable attention is also being given to the cultivation of castor bean and peppermint. The oil from the latter, however, is still largely prepared in a very crude manner. Both yield and quality have, therefore, been poor.

Catalogues and reports received:—

Vorzugs-Preise der Medicinal-Droguen-Handlung en gros G. & R. Fritz, Wein. Juli, 1896.

Gehe & Co. — Dresden. Handelsbericht. September 1886.

Noyes Bros. & Cutler—St. Paul, Minn. Catalogue of Drugs, Chemicals, Patent Medicines, Paints and Oils, Varnishes, Window Glass, Druggists' Sundries etc. One vol., pp. 724.

Catalogue of Surgical and Dental Instruments and Appliances: microscopes, physical and histological apparatus, galvanic batteries, artificial limbs and eyes, deformity apparatus, elastic stockings, trusses etc. One vol., pp. 784.

DRUG STORES—Before you buy or sell, send for our circular of information. Inter-State Druggist Agency, Pontiac Bldg., Chicago.

For clerks or vacant positions in Wisconsin drugstores apply to Wisconsin Druggists Exchange, E. B. Heimstreet, Janesville.

SUPPLEMENT, NOVEMBER 1896.

Universities and Colleges.

University of Vienna.

During the summer semester 4,209 regular and 1,587 students, in all 5.996, had matriculated. Of these 169 were inscribed in the theological, 2,654 in the law-, 2,228 in the medical and 686 in the philosophical faculty. The number of pharmacy students was 69, coming from twelve provinces of the empire and one each from Russia, Servia and Bulgaria.

Pharmaceutical Society School of Pharmacy.

With this year's opening of the School at Bloomsbury Square the "third chapter" in its history is said to have been fairly begun. Both course and instructional force have been remodeled and the British seem to be very hopeful for the future. Neither do they apparently intend to stop short with the present improvement. "A desire has been felt, if not expressed, that the future improvement in educational methods should be regular and continuous. The School of Pharmacy of the Pharmaceutical Society should always be in the van, progressing by almost imperceptible steps rather than by periodic resolutions, and advancing so steadily to new positions that they will be attained and firmly held before the surrender of older positions seems to have become matter for formal consideration."

Wash. Expt. Stat. School of Pharmacy.

It is reported that a course of pharmacy, to cover a term of two years has been organized in connection with the State Agricultural Experiment Station at Pullman, Wash.

Chicago College of Pharmacy.

On the afternoon of Oct. 6, the Chicago College of Pharmacy for the first time opened its doors to students as the School of Pharmacy of the University of Illinois. Addresses were made by President Draper of the University, by Dr. H. H. Rogers of the Advisory Board and others.

Oxford Botanic Garden.

The Botanic Garden at Oxford is said to be the oldest in Great Britain. It was presented to the University in 1632 by Henry L. Danvers, earl of Danby, who spent a large sum in filling in the ground to raise it above overflow from the river that runs along one side. He also built the high stone wall about it, as it now stands at an expense of 5000 pounds sterling. Part of the elaborate gateway designed by Inigo Jones, including the statues of Charles I and Charles II, was added later. It is a curious feature that the ground on which Lord Danvers spend such a large sum of money was not bought, although it must have been a cheap piece of land, but was leased from Magdalen College at an annual rental of thirty pounds sterling. The lease is still in force without alteration, the last renewal in December 1880, being for sixty years. There is no danger, as reported in American journals, that the lease will ever be closed or changed, unless it is the desire of the University. [Bot. Gaz., 22, p. 192,]

Scientific Societies.

German Apothecaries Society.

The Deutscher Apothekerverein celebrated its twenty-fifth anniversary at Dresden. At the time of the reorganization of the German Empire there existed in Germany the Norddeutscher Apothekerverein, which antedated the Norddeutscher Bund by 46 years, and the Süddeutscher Apothekerverein. The preliminary steps to a union of the two were taken in Dresden in 1871, and a definite union was effected the following year. The festivities in Dresden were in celebration of this union of the pharmaceutical north and south of Germany.

With the exception of a few lectures the work of the association consisted chiefly in the discussion of internal matters of a commercial or professional nature. Of the various questions discussed the one of interest to outsiders is that of a more thorough general and scientific education of the pharmacist. The reelection of three of the four outgoing members of the council, as well as other less silent expressions, would seem to indicate that those who ask for more gymnasium and university education and less training in the shops as apprentice and assistant are gaining ground more and more.

The annual meeting is principally a congress of delegates of the numerous local societies. The association has its own semi-weekly organ, the Apotheker Zeitung; the Archiv f. Pharmacie for strictly scientific publications; and its yearbook, which is the most valuable of its kind. Prof. Beckurts, the editor of the last named publication, was this year elected an honorary member. In order that the pharmacists need not wait for the yearbook for current scientific information Prof. Beckurts regularly supplies the Apotheker Zeitung with a repertory of pharmacy. The exhibit in connection with the meeting does not appear to have afforded anything striking with the exception of the collection of pharmaceutical literature, which was of an historic nature.

Verein Deutscher Naturforscher und Aerzte.

The Verein Deutscher Naturforscher und Aerzte held its 68th session in Frankfurt on the Main beginning Sept. 21. The Section on Pharmacy was well attended and a fair number of good papers were read.

Prof. Dr. A. Tschirch — Bern: Ueber die Chemie der Harze.

Dr. Kunze-Krause — Lausanne: Beiträge zur Klassifikation der Gerbstoffe und Mittheilungen über die Bildung von Blausäure aus ungesättigten organischen Verbindungen bei Gegenwart von salpetriger Säure in der Kälte.

Med. Assessor Dr. Vulpius — Heidelberg: Ueber die Aufbewahrung verschiedener Arzneimittel.

Dr. med. Baron von Oefele — Neuenahr: Ueber vorhippokratische Pharmacie.

Prof. Dr. Partheil — Bonn: Ueber Arzneimittelprüfung.

Dr. med. Heffter — Leipzig: Beiträge zur chemischen Charakterisirung der Cacteen.

Dr. **Schneegans** — Strassburg: Ueber Pyrethrin, den wirksamen Bestandtheil der Wurzel von Anacylus Pyrethrum D. C.

Dr. **Gadamer** — Marburg: Die Chemie des schwarzen und weissen Senfs.

Pharmaceutical Stipends and Prizes in Germany.

The Deutscher Apothekerverein distributed during the past year 3,600 M. as stipends. The sums disbursed from the various endorsed funds in charge of the association are: —

Weber — Stiftung	200 M.
Phoebus — Stiftung	200 "
Gehe — Stiftung	480 "
Meurer — Stiftung	225 "
Hagen-Buchholz — Stiftung	116 "
Dr. C. Lampe — Stiftung	70 "
R. Trommsdorff — Stiftung	360 "
Bergter — Stiftung	105 "

The Pharmaceutische Zeitung again offers the sum of 1,000 M. in stipends of 200 M. each to pharmaceutical students attending or wishing to attend a German university.

Prof. Hilger of Munich announced to the German Apothecaries Society that he offers three prizes of 300 M. each to pharmaceutical students or registered pharmacists of Germany for the best solutions of the following problems:

Compilation and critical discussion of the international literature since the year 1800 and methods of assay: —

1) of powerful and narcotic drugs and extracts with the exception of opium;

2) of the various known resins;

3) of volatile oils.

Proceedings and Catalogues received:—

Proceedings Pennsylvania Pharmaceutical Association at the nineteenth annual meeting in Holly Inn, Mt. Holly Springs, June, 1896. With the constitution, by-laws, code of ethics, and roll of members. Brochure, pp. 206.

Proceedings of the eighteenth annual meeting of the New York State Pharmaceutical Association, held at Buffalo, June, 1896. Also the constitution, by-laws and roll of members. Brochure, pp. 180.

National Institute of Pharmacy—Chicago. 22nd Semi-Annual Announcement. 1896—96.

History.

The Fiftieth Anniversary of Ether as Anæsthetic.

Prof. Kobert, in a review of Binz's work: Der Aether gegen den Schmerz, briefly relates the modern history of anæsthetics in the following words. "It is the duty of pharmacotherapy, one of the most important branches of medicine, to prepare, test and improve remedies which in part remove disease, in part alleviate pain. Pharmacotherapy celebrates on the 17th to 18th October of this year a jubilee in worthy succession to the anniversary of the inocculation by Jenner. The above date marks the fiftieth year since larger surgical operations can be performed without pain. Attempts to perform painless operations by benumbing the patient to senselessness date back centuries. Binz discusses the evolution of this problem during the past hundred years. He has duely considered both American and English literature, which was difficult to obtain and has seen all of the more important works in the original. The presentation by Binz of the early attempts with laughing gas, ether and chloroform is as interesting as a novel. The fiftieth anniversary is that of the ether, which was known as early as the middle of the 16th Cent. Valerius Cordus, its discoverer, was one of the most renowned physicians and botanists of his time. Pharmacotherapy owes to him not only the discovery of ether but also the compilation of the first pharmacopœia. As a general remedy ether came into use through Friedrich Hoffmann († 1742), the famous clinician at Halle, in whose honor the mixture of ether and alcohol (1:3) is still called Hoffmann's drops. A narcotising effect, however, is not produced by the internal administration of a small amount of these drops. Prof. Charles Jackson of Boston in the winter of 1841—42 broke a large container filled with chlorine. The irritating vapors produced a violent cough. In order to alleviate this he inhaled ether vapors hoping that the chlorine would combine with the ether to a less irritating substance, viz. ethyl chloride. The inhalation relieved him greatly and he recommended during the next few years ether as an alleviator of pain during tooth-extractions, among others to the dentist, William Morton, on the 30th of September 1846, who on the same day performed several painless extractions. He then persuaded the hospital surgeon, Dr. Warren, to nacotize several patients on whom larger operations were to be performed. This was done on the 17th and 18th of October 1846. The result was brilliant and in a few weeks the entire continent knew of the important discovery. A few months later it was known throughout Europe. As might be expected the new method of treatment had its opponents who based their opposition on the biblical passage "in sorrow thou shall bring forth children" who considered the use of ether during birth as a great sin and the alleviation of pain in any form as a wicked interference with the divine order of things.

Personals.

The Dutch apothecary van Ledden Hulsebosch has resigned from his position as editor of the Pharmaceutisch Weekblad voor Nederland, which position he held for five years. S. van Itallie is his successor.

Prof. Henry Kraemer has returned from a year's study in Germany and now occupies the chair of pharmacognosy at the Illinois College of Pharmacy.

Dr. Otto Schlotterbeck has assumed his duties as assistant professor of pharmacognosy at Ann Arbor, having completed a year's work at the University of Bern under the direction of Prof. A. Tschirch.

Bibliography.

Science was established in 1883 by Mr. A. Graham Bell, who, in conjunction with Mr. Gardiner G. Hubbard, spent more than $80,000 in maintaining it. The loss involved was so large and so continuous, that the generous donors finally felt compelled to withdraw their aid, and publication was suspended in 1894. Later an arrangement for cooperation was made between Science and the American Association for the Advancement of Science, in accordance with which the Association agreed to appropriate $750 annually towards the support of the journal. But, in view of the fact that it has become necessary to take this money from the invested funds of the Association, it has seemed to friends of the journal and of the Association undesirable to continue this appropriation for the present. Science now, under able management, occupies a field which it would be discreditable to American science to leave unfilled, and it is to be hoped that its claims will be recognized by a renewed support.

Janus, an international archive for the history of medicine and medical geography, apparently rests on a substantial basis as far as editors and colaborers are concerned. The director of the bimonthly is Dr. H. F. A. Peypers, Parkweg 62, Amsterdam. The American editors are Prof. Wm. Osler of Johns Hopkins University, Prof. Peffer, formerly provost of the University of Pennsylvania, and Surgeon-General Dr. Geo. M. Sternberg of Washington, D. C. Prof. Th. Husemann of Goettingen contributes an article of pharmaceutical interest to the first number: Zur Vorgeschichte des Lanolins. Other articles of special pharmaceutical interest either in preparation or in manuscript are:

Dr. A. Gruenfeld. Die neuen Mutterkorn-Epidemien in Russland.

Prof. M. Steinschneider. Verzeichniss von über 600 Simplicia, arabisch mit Nachweisung der wichtigsten Quellen.

Prof. A. Husemann. Die Koeln. Pharmacopoe von 1565.

Trosse. Welche Völker nennt Alexander Trallianus als Drogenlieferanten?

Dr. R. Landau. Die Pharmacopoe im XVII. Jahrhundert.

A fully illustrated article on Public Aquariums in Europe, in which those of Naples, Amsterdam, Paris, Berlin and Brighton are described, will be contributed to Appletons' Popular Science Monthly for November, by Prof. Bashford Dean, of Columbia University.

The completion of the 26. "Jahrgang" of the Pharmaceutischer Kalender 1897 is announced by Julius Springer. The special feature of the new edition is an article on "The central water supply of municipalities, institutions and individual buildings", by Dr. B. Fischer of Breslau.

Fr. Vieweg und Sohn announce the completion of the Jahrbuch der Chemie for 1895, which contains an account of the most important progress made during the year in pure and applied chemistry. In fifteen chapters the progress made in physical, inorganic, organic, physiological and pharmaceutical chemistry, the chemistry of food-stuffs and beverages, agricultural chemistry, metallurgy, fuels and inorg. technical chemistry, explosives, technology of the carbohydrates and the ferment industries, of the fats and petroleum, the chemistry of the aniline dyestuffs, technology of fibres and photography is reported by twelve specialists.

The fall announcements of The Macmillan Company call attention to a new college text-book on physics by Professors Nichols and Franklin, both of the department of physics in the Cornell University. It is to be a three volume work.

The October number of Appletons' Popular Science Monthly contains an interesting reply by Prof. T. C. Mendenhall, President Worcester Polytechnic Institute, to Mr. Herbert Spencer's article on The metric system, which appeared in the June number of the same journal. It also contains the conclusion of Prof. C. F. Hodge's able article on The Vivisection Question. Under the title of Some Beginnings in Science Prof. Collier Cobb relates about the early science work at the University of North Carolina.

With the October number Science Progress becomes a quarterly, instead of a monthly as hitherto. The journal, conducted by Mr. Henry C. Burdett and edited by Mr. J. Bretland Farmer, with the cooperation of an able editorial committee, was founded two and a half years ago, and has maintained a uniformly high standard of scientific excellence.

Catalogues received:—

The Macmillan Comp. — New York. A list of scientific and technical books.

Lemcke & Buechner—New York. Monthly bulletin of world literature. Nos. 7 and 8.

Commercial.

As already stated in the April Report of Schimmel & Co. the rose plantations of Gross Miltiz, Saxony have been entirely unharmed by frosts, and exceedingly favorable weather was experienced during the period of development and blooming of the flowers. The cool temperature which predominated throughout the season prevented the roses from blooming simultaneously, thus enabling a careful harvesting and immediate distillation of the material. As a consequence unusual excellence is claimed for the product. The gathering lasted from June 18th until July 15th, or 28 days. The maximum yield of one day amounted to 40,000 lbs. rose petals; the average yield for one day was 21,000 lbs; the total crop of rose petals during 1896 was 590,000 lbs., which represents a production of about 132 lbs. of pure otto of roses.

Catalogues received: —

G. & R. Fritz — Wein. Preisliste, Mitte Seytember.

Parke Davis & Co. — Detroit. Price List 1896.

Roessler & Hasslacher Chem. Co. — New York. September List.

Schering & Glatz — New York. Price List of Fine Chemicals.

—— Price List of Medicinal and Toilet Soaps.

Tasteless Quinine Sulphate.

A Substance which was claimed to be tasteless quinine sulphate was recently examined by Ferd. A. Sieker. It was offered by a Southern manufacturing house and was accompanied by printed matter setting forth its advantages over the bitter alkaloid and showing that a number of Western and Southern wholesale druggists had accepted the selling agency for their respective territories.

The following description is copied from the label of a one ounce can:

FLORA-CHINA.

"Pure Sulphate of Quinine, Andiperiodic, Antifebrile, Tasteless. Given in all Intermittend and continued types of Fevers. Given in the same doses as the old style Quinine and wherever indicated. Manufactured by the ——, Manufacturing Chemists, ——. Fla."

The following is an extract from a letter received from the introducers of Flora-China:

"It is needless to expatiate upon the merits of our Flora-China—it is a sulphate of quinine—from bark—tasteless—it takes wherever shown—it gives satisfaction," etc.

A red circular with violet print gave the following interesting information:

"Sir: Kindly give the sample of our quinine trial; it will speak plainer for itself than easily gotten testimonials (?) or vague assertions in printed form. We only claim for it to do what the bitter quinine does—no more—no less.

"Upon its merits and your own judgement we depend for success. Remember it were folly for us to place on trial and waste our time and money on an article which would fail to accomplish the purpose this sample is intended for, to convince through your own experience that it does the work. Courteously, etc."

From the appearance, the substance in question might have been mistaken for an alkaloid. It occurred in the form of fine needle-like crystals, more translucent than those of quinine sulphate. It was odorless and tasteless, sparingly soluble in water, insoluble in alcohol and neutral toward litmus. Small quantities heated in a glass tube and on platinum wire respectively gave no evidence of volatilization (excepting water), combustion or carbonization which was conclusive evidence that the substance under examination was not a carbon compound!

On continued heating on a platinum wire in a colorless flame, the substance became more opaque, and colored the flame reddish yellow, indicating the presence of calcium. The aqueous solution gave a precipitate with ammonium oxalate insoluble in acetic but soluble in hydrochloric acid (calcium). Another part of the solution gave a precipitate on the addition of barium chlorid T. S. insoluble in hydrochloric acid (sulphuric acid). A small quantity mixed with dry sodium carbonate and heated on charcoal in the reducing flame yielded sodium sulfid as was shown by bringing in contact with a bright silver coin and also by the odor of H_2S on the addition of an acid (sulphate). An aqueous solution of the substance did not yield a precipitate on the addition of calcium sulphate T. S. (absence of Sr.). The addition of alcohol to an aqueous solution of "Flora China" caused precipitation.

On carefully heating, it lost 21 percent of water of crystallization. Cryst. calcium sulphate, $CaSO_4, {}_2H_2O$ theoretically demands 20.92 percent of water of crystallization.

It did not respond to reagents for alkaloids (Mayer's solution, etc.). *"Flora China" is therefore artificial crystallized calcium sulphate and does not contain a trace of quinine!*

It was offered at the wholesale price of 50 cents per ounce in 1 ounce cans down to 35 cents an ounce in 100 ounce cans, while the instrinsic value of the preparation is not over 10 cents per pound.

GLENN'S
SULPHUR
SOAP.

GLENN'S SULPHUR SOAP

Is the ORIGINAL and BEST combination of its kind, and the one now generally in use.

BEWARE OF COUNTERFEITS.

THE CHARLES N. CRITTENTON CO.,
New York.

SUPPLEMENT, DECEMBER 1896.

Universities and Colleges.

Buitenzorg.

The government of Dutch India has allowed M. 24,000 for the erection of a research laboratory in the botanical garden at Buitenzorg near Batavia.

Paris School of Pharmacy.

The faculty for the 1896—97 session consists of M. Riche, mineral chemistry, M. Planchon, materia medica, M. Milne Edwards, zoology, M. Moissan, toxicology, and M. Jungfleisch, organic chemistry.

California College of Pharmacy.

The twenty-third annual commencement exercises of the departement of Pharmacy of the University of California were held on the twelfth of last month at Native Sons' Hall, San Francisco.

University of Strassburg.

The Imperial Friedrich Wilhelms University will celebrate the twenty-fifth year of its reorganization as a German University on May first of next year. Preparations for an elaborate celebration are being made.

The Imperial Institute Research Laboratory.

This laboratory was formally inaugurated on Monday evening, Nov. 9, by Mr. W. R. Dunstan, the Director of the Scientific and Technical Department of the Institute. The chemical staff includes most of the former students in the Phar. Society Research Laboratory, who have accompanied their chief to his new quarters. Natural products from India and the Colonies are being investigated with a view to their commercial utilization.

Massachusetts College of Pharmacy.

The year at this school has opened auspiciously. Several have applied for the new degree, Ph. C. which is now offered. It is intended to make this degree correspond in character of requirements to the same as given by the best university schools. No store experience is required, but candidates must spend their entire time during two years at the school.

The pharmaceutical laboratory has been enlarged during the summer, thirty-two new desks having been added. Laboratory work is now required in the general chemistry course. This makes laboratory work compulsory in connection with every course, during both junior and senior years.

The recent death of Professor Markoe will cause no further change in the Faculty, this contingency having been provided for last spring. The position of Professor of Industrial Pharmacy, to which he was elected, will remain vacant. Professor Scoville succeeds him in the chair of Theory and Practice of Pharmacy, and E. H. La Pierre Ph. G. is the newly-appointed Professor of Applied Pharmacy. During the coming winter an effort is to be made to prepare prospective graduates for an active part in the affairs of pharmacy after graduation, by talks upon topics which may inform them in regard to present conditions, tendencies, and efforts of pharmacy and pharmacists throughout the country.

History.

Justus v. Liebig.

Number eight of Gaea contains a continuation of the memoirs of Voigt referred to on p. 26. of the October Supplement. There are several more references to Liebig, which throw interesting side lights on the life of this famous chemist. Liebig's attitude toward a proprietor of a dye-works should be of considerable value to pharmacists who are interested in the live topic of practical experience before or after college education. "So erzählt er (Vogt) wie eines Tages ein grosser, starker Mann mit seinem Sohne zu Liebig kam. Es war einer der Baumwollprinzen aus Mülhausen, und da er eine laut hallende Stimme besass, so hörte man jedes Wort. Er bitte Herrn Liebig, sagte er, seinen Sohn als Lehrling einzustellen. Derselbe solle in der Fabrik die Färberei übernehmen; ein anderer Sohn stehe an der Spitze der Weberei, ein anderer dirigiere die Spinnerei. Er bitte also Herrn Liebig, seinen Sohn in den Farben zu unterrichten. "Ich bin kein Färber," antwortete Liebig, "ich kann Ihren Sohn nicht brauchen! Nehmen Sie ihn nur wieder mit und thun Sie ihn in eine Färberei!" Der Mann legte sich aufs Bitten; Liebig wiederholte heftig seine Weigerung. Als der Mann zu schluchzen anfing, hörten wir endlich, wie Liebig nachgab. "Ich dirigiere ein chemisches Laboratorium," sagte er, "und keine Färberei. Aber ich will Ihnen etwas sagen. Wenn Sie Ihren Jungen hier lassen wollen, so will ich, wenn er anders Anlagen hat, einen tüchtigen Chemiker aus ihm machen. Aber er muss zwei Jahre bleiben und sich nur mit Chemie und nicht mit Farben beschäftigen. Davon soll er gar nichts hören. Aber wenn er dann nach Hause kommt, so wird er in vierzehn Tagen mehr von Farben verstehen als alle Ihre Färbemeister zusammen genommen. Sie verstehen?" — Der Mann verstand und hatte es später nicht zu bereuen."

On the other hand Liebig did not lay much stress on the traditional requirements of a gymnasium education preliminary to university work. As a consequence he was in perpetual warfare with the "Universitätszöpfen" who considered Liebig a "verderbliches, schädliches Element, dem man um jeden Preis Halt gebieten müsse." After Liebig's laboratory had become world famous he had free play.

Two other abstracts from Voigt's memoirs may be quoted as of special interest. "Wir wurden bald zu den Arbeiten unseres Meisters selbst zugezogen, während er zugleich darauf drang, dass wir eigene Arbeiten machen sollten. 'Nichts eifert die jungen Leute mehr an,' sagte er, 'als ihren Namen gedruckt zu sehen. Die Franzosen haben ein ganz verkehrtes System. Alles, was in einem Laboratorium in Paris oder in der Provinz gemacht wird, muss unter dem Namen des Professors in die Welt gehen. Das entmuthigt die jungen Leute, abgesehen davon, dass der Professor oft für Dummheiten einstehen muss, die ihm doch nicht zur Last fallen. Dieser Dumas, er hat Dinge vertreten müssen, die seine Assistenten verschuldet hatten. Die Leute, die bei mir arbeiten, publizieren unter ihrem Namen, wenn ich ihnen auch geholfen habe. Wenn es etwas Gutes ist, so schreibt man mir doch einen Theil davon zu und die Fehler brauche ich nicht zu vertreten. Sie verstehen?'"

"Wenn Liebig in einer Arbeit war, mochte es nun eine Untersuchung oder eine schriftliche Abhandlung sein, so kannte er nicht Ruhe noch Rast. 'Er schreibt die Abhandlungen', sagte mir einmal einer seiner Kritiker, 'wenn der Tiegel mit den Resultaten noch im Feuer steht und wenn er sich die Finger beim Herausheben verbrannt hat, schickt er das Geschriebene in die Druckerei!' Aber trotz seiner Hast war er ein ausserordentlich geschickter und sorgfältiger Experimentator im Laboratorium. Freilich wurde dieses förmlich durcheinander gewirbelt auf der Höhe der Aktion und im Feuer des Eifers wurde niemand geschont. Er erscheint, ein Glasfläschchen mit eingeriebenem Stöpsel in der Hand. 'Machen Sie einmal den Arm bloss,' sagte er zu mir. Ich thue es; er schüttelt das Fläschchen und tupft mir mit dem Stöpsel auf den Arm. Ich fühle einen brennenden Schmerz und tauche augenblicklich den Arm in einen Kübel mit Wasser. 'Nicht wahr, es brennt?' sagte er. 'Sie sehen. Ich habe eben wasserfreie Ameisensäure dargestellt; ein Tröpflein ist mir auf die Backe gespritzt und hat gleich ein Bläschen gemacht. Sie sehen? Geben Sie auch Ihren Arm, Demarçay!' Einige halten den Arm hin, Ettling weigert sich entschieden. 'Sie haben nicht unrecht — ich glaube, die Herren werden morgen alle dick geschwollene Arme haben. Diese wasserfreie Ameisensäure, sie ist ein Ätzmittel! Alle wasserfreien Säuren müssen Ätzmittel sein, weil sie den Geweben augenblicklich Wasser entziehen!' — Ich hatte die stärkste Portion bekommen, musste einige Tage den Arm in der Binde tragen und noch heute steht auf meinem Arme die kreisrunde, weisse Narbe als Erinnerung an die Entdeckung der wasserfreien Ameisensäure."

A Potato Tercentenary.

The holding of a potato tercentenary in England this year is now being agitated. As one of our foreign exchanges states: "In 1596 the first potato was planted in England, in Holborn, about the time that Sir Walter Raleigh was planting the first Irish potato at Youghal near Cork. For two centuries the potato continued as a botanical curiosity. When first eaten it was a delicacy, sometimes roasted and steeped in sack, or baked with marrow and spices or preserved and candied. When Parmentier developed the plant in France, Louis XVI and Marie Antoinette wore the flowers as ornaments. Frederick the Great had to force the Pomeranian farmer to plant potatoes by the fear of the soldiers. It was the famine of 1771—72 in Germany that first demonstrated the value of the 'tubers'. The fact is that it has been only within the past century that the potato has risen in its prominence as an esculent, even in Ireland, the land of the murphies'."

The introduction of the potato into England was directly due to Sir Walter Raleigh, whose Virginia expedition ships brought back some of the tubers in 1586; but to the Spaniards is really to be credited the discovery and European introduction of the new article. It was undoubtedly through the Spaniards that the potato was brought to Virginia. There is no proof that the North American Indians cultivated the potato before the Spanish Conquest. It grows wild today, as then in Peru and Chile. The Spaniards carried the tuber to Spain long before the Raleigh incident; and from Spain it was taken to Italy, from which country it was introduced into Flanders, in 1859. The date of the proposed English tercentenary will therefore be about ten years too late. The very name of potato comes from the Spanish "batata".

But the potato has of late years fallen into something of its early contempt. The scientists of the cuisine, such as Dr. Cyrus Edson and Mrs. Rorer, are warning eaters not to depend too much upon the potato for nutriment. Leguminous food should largely supplement its use. Furthermore, overindulgence in a potato diet conduces to dyspepsia; and herein may be revealed the origin of the prevalence of that distressing complaint in America. The potato is not a root, as so many are accustomed to style it; it is an underground stem, swollen up by accumulated starch stored up for future use. Its exact place in the dietary has not yet been settled. It is a curious thing to note, too, that to the same genus (Solanum) belongs tobacco, which was given to Europe at about the same time as the potato; and the tomato and egg plant are its fellow esculents.

[Scientific American, Vol. LXXV, No. 17; from
Southern Planter.]

In Memoriam.

Henry Trimen.

Dr. Trimen, who died in October at Peradeniga, Ceylon, in his fifty-third year, was late Director of the Royal Botanic Gardens, Ceylon. He is best known to pharmacists, as joint author with Bentley of "Medicinal Plants", a most valuable work, prepared while he was senior assistant in the botanical department of the British Museum. He was also for many years editor of the Journal of Botany, one of the authors of Trimen and Dyer's "Flora of Middlesex", and of late years had been engaged in writing his "Handbook to the Flora of Ceylon". Three volumes of this have been published, and the fourth will complete the work.

Eugen Sell.

Professor Eugen Sell of the University of Berlin and member of the Imperial Sanitary Station died Oct. 13 at the age of fifty-five years. He was born April 5, 1842, in Bonn, studied chemistry and became docent in chemistry at the University of Berlin in 1870, holding at the same time a position at the Gewerbeakademie. In his earlier years, Sell devoted his time primarily to theoretical, organic and analytical chemistry. Later, however, and especially after he became member of the Imperial Health Station, he applied his knowledge and experience in the direction of hygiene and the chemistry of food-stuffs. He was instrumental in securing favorable legislation for the special training and examination of food-chemists, and since 1894 was a member of the examining commission of "Nahrungsmittelchemiker" at the University of Berlin. Of his literary productions special attention should be called to his contributions in the Arbeiten des kaiserl. Gesundheitsamtes and in the Vierteljahresschrift über die Fortschritte der Chemie der Nahrungs- und Genussmittel.

Ferd. v. Mueller.

The famous botanist Baron Ferdinand von Mueller, Director of the Botanical Garden of Melbourne, Australia, died Oct. 9. He was born June 30, 1825 in Rostock, studied 1846—47 in Kiel and emigrated with two sisters to Australia. After a number of excursions Mueller was appointed government botanist for Victoria and in 1855 accompanied Gregory on his geodetic expedition to West Australia. Upon his return he conducted the laying out and assumed directorship of the botanical garden in Melbourne. When the University of Melbourne was established he became a member of its faculty. Mueller was especially active in systematic botany. He named not less than 2000 plants. He also did much for the zoologic and geographic exploration of Australia. He contributed many specimens to European and American museums, but on account of his personal friendship with Director v. Krauss was especially liberal to the museum at Stuttgart. His generosity was rewarded by being knighted in 1870. Science has honored him in various ways, most numerously, however, by naming many species of plants after him.

Alfred H. Mason.

On the morning of the second of November Mr. Mason died of pneumonia, having been ill but a very short time, his illness being unknown to most of his friends.

Alfred Henry Mason was born at Newcastle-Under-Lyme, England, fifty-three years ago. He began his pharmaceutical career early and worked his way up by hard work. He came to Montreal in 1884, but returned to England in 1888 to represent the firm of Seabury & Johnson. During this short period of four years he thoroughly identified himself with American pharmacy in various capacities. In England also he soon became reidentified with association and educational affairs. Being made secretary of the firm of Seabury & Johnson in 1892 he returned to this country the following year. During the short period remaining he was unceasingly active. He was one of the organizers of the N. Y. Section of the Society of Chemical Industry and served as its first chairman. He succeeded Mr. Hegeman as secretary of the New York College of Pharmacy and also served as editor of the Alumni Journal.

Eugen Baumann.

The Professor of Medical Chemistry at the Univerity of Freiburg died on the third of last month. Eugen Baumann was born Sept. 12th, 1846 in Cannstadt, where his father was apothecary. Eugen attended the Latin School of Cannstadt and later the Obergymnasium at Stuttgart. Having completed his preparatory studies he matriculated at the Polytechnicum in Stuttgart. At the same time, following the wishes of his father, he familiarized himself with pharmacy and passed the assistants examination. In 1870 while in Tuebingen to prepare himself for the apothecaries career he met Prof. Hoppe-Seyler, who influenced him to adopt the scientific career by offering him the position of assistant. Here he received his doctor's degree in 1872. When Hoppe-Seyler was called to Strassburg, Baumann followed as his assistant and became Privatdocent in 1876. When Emil du Bois-Raymond established his arge physiologic institute in Berlin, Baumann was offered a position in physiological chemistry. In 1882 he was made extra-ordinary professor of the medical faculty. The following year he was offered a full professorship in medical chemistry in Freiburg, where he remained to his end.

The scientific career of Baumann covers almost a quarter of a century. Much of his work was important to pharmacy as well as to medicine. He became more particularly known to chemists through his work on paired sulphuric acids and the physiological conslusions drawn therefrom. More popularly his name is connected with the introduction into medicine of sulfonal and trional, and with the determination of the presence of iodine in the thyroid gland.

Though lost to pharmacy in a direct sense, the former apothecary reflected credit upon the calling of his father as well as upon the little university of Tuebingen from which so many physiological chemists have emenated.

Bibliography.

Les Fils D'Émile Deysolle announce the completion of volume 17 (Cölentéres, Échinodermes) of the Natural History of France. The work is to be complete in 26 volumes: 17 on geology, 5 on botany, and one each on geology, paleontology, mineralogy and technology or application of the natural sciences.

The Robert Clarke Company is apparently kept busy turning out edition upon edition of Prof. Lloyd's Editorhpa. Hardly has the sixth edition been placed upon the market when the seventh is already contemplated. Readers of Etidorhpa may be interested to know that the work is being translated into French.

The Annales de l'Institute colonial of Marseilles will publish toward the end of this month a Flore de la Guadelupe et de la Martinique by R. P. Duss, professor of natural history at the collège de la Banetene (Guadeloupe). Notes with regard to the economic uses of these plants are supplied by Professor Heckel. The volume will contain about 500 or 600 pages.

The Chemical Publishing Company announces the completion of the third edition of each of the following books: Chemistry for Beginners by Edward Hart, Professor of Chemistry at Lafayette College, and Notes on Qualitative Analysis by Prof. M. P. Mason of the Rensselaer Polytechnic Institute.

The first edition of Dr. Jul. Otto's Ausmittelung der Gifte was published in 1856. The first part of the seventh edition, edited by Dr. Robert Otto and published by Friedr. Vieweg & Sohn was ready this spring and comprises the volatile and alkaloidal poisons. The second part comprising the inorganic poisons and the chapter on the recognition of blood stains is to be ready this fall.

The November Popular Science Monthly, No. 1 of vol. 50, contains an interesting and well illustrated article on Public Aquariums in Europe by Bashford Dean of Columbia University. It also contains an editorial explanation of President Jordan's article on the Symphsychograph, which appeared is a recent number of the same journal, and which stirred up many minds. The editor designates it "an almost too successful joke".

The Chemische Rundschau is a new journal published in the interest of the entire chemical industry and edited by Dr. Franz Peters of the Kgl.-Tech. Hochschule zu Charlottenburg.

The jury of the Second International Pharmaceutical Exhibition at Prague has awarded the firm of Wilhelm Braumueller the silver medal for the Handwörterbuch der Pharmacie edited by A. Brestowski.

Julius Springer announces as just out Dr. Max Biechele's Anleitung zur Erkennung, Prüfung und Werthbestimmung der gebräuchlichsten Chemikalien für den technischen und pharmaceutischen Gebrauch.

The very valuable Bericht of Schimmel & Co., which for about five years has also appeared simultaneously as Semi-Annual Report in the English language, will hereafter be translated into French.

Lea Brothers & Co. announce as just ready the fifth edition of Remsen's Theoretical Chemistry. The book is translated into both German and Italian and the new edition has been thoroughly revised by the author.

Professors O. Schrader of Jena and O. Engler of Berlin have edited the sixth edition of Victor Helm's Kulturpflanzen und Hausthiere in ihrem Uebergange von Asien nach Griechenland und Italien sowie das übrige Europa. This is the first edition of the popular historic philologic sketches since the death of the author. Without marring the original text the book has been brought up to the present status of scientific investigations along these lines by notes by the new editors. The book is published by the Gebrueder Borntraeger of Berlin.

A biographical sketch of the famous physiologist Carl Ludwig (see Pharm. Rundsch., vol. 13. p. 144), written by Dr. J. von Kries, Professor of Physiology at the University of Freiburg i. B., has been published by the Akademische Verlagsbuchhandlung of J. C. B. Mohr.

The Pharmaceutical Era, which with this months' issues completes its first decade, will celebrate this fact by the publication of a Tenth Anniversary Number. A number of well-known pharmaceutical writers will contribute to this number, which is advertised as "an encyclopedia of drug trade facts."

The second volume of Our Native Birds of Song and Beauty, by Henry Nehrling, custodian of the Milwaukee Public Museum, is now ready. The first volume has received nothing but the most unstinted praise and lovers of birds will be glad to learn of the completion of the work. It is published by Geo. Brumder of Milwaukee, Wis.

Catalogues received:—

Geo. Brumder—Milwaukee, Wis. Illustrirter Porträt-Katalog der empfehlenswerthesten Bücher der deutschen und englischen Literatur. pp. 140.

Gustav Fock—Leipzig. Lagerverzeichniss No. 117: Chemie und Pharmacie, chemische Technologie, Hygiene, Bakteriologie, Mikroskopie.

Lemcke & Buechner—New York. Monthly Bulletin of World Literature No. 9.

Julius Springer — Berlin. Empfehlenswerthe Werke für Pharmaceuten.

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EDITORIAL.

Retrospect.

> "We live in deeds, not years; in thoughts, not breaths,
> In feelings, not in figures on a dial,
> We should count time by heart throbs. He most lives
> Who thinks most, feels the noblest, acts the best."
> *Bailey.*

However strongly we may be impressed with the truth of the words that we "live in deeds not years" we may yet feel with equal force the importance of stopping when with the end of a year we have reached another mile stone. Though our individual lives, the generation in which we live, dwindle into insignificance when compared with the incomprehensible something called time, a single year, every month, each day may be of the greatest importance to us in the moulding of character. In the present steeple chase after fortune it would be well for us if with Walther von der Vogelweide we could occasionally say:

"Ich sass auf einem Steine,
Da deckt ich Bein mit Beine,
Darauf der Ellenbogen stand;
Es schmiegte sich in meine Hand
Das Kinn und eine Wange.
Da dacht' ich sorglich lange
Dem Weltlauf nach und ird'schem Heil."

Somewhat more than a year ago a German professor of physical chemistry roused the scientific world by a bold denunciation of scientific materialism. The address was published, republished, translated and subjected to minute criticism. The controversy has now subsided. As to whether science has taken a step forward or not the future may decide. This address may or may not mark a chapter in the development of human thought, but that it will have any immediate effect on human life or character seems very doubtful.

There is another materialism which is of graver consequence: **professional and commercial materialism.** Scientific materialism may have been a fad and have found many followers among the half-educated, would-be scientific minds, who imagined themselves as belonging to the intellectual four hundred of the enlightened nineteenth century. Professional materialism appears to have a deeper root than fashion.

The desire for worldly fame and fortune has always been strong in man. It appears, however, that at no time has it manifested itself more strongly and universally than at present. In the medical profession, which considers itself the noblest, most self-sacrificing calling, the desire for gain and for fame bordering on notoriety would be considered a scandal if the general public were not so largely travelling the same road to fortune and success. The price demanded by great surgeons for a single operation may be denounced as extortion, but the M. D. who sells his knowledge, though for a smaller sum, to the highest commercial bidder is in reality not an iota better. The physician who clamors for notoriety through the daily press by announcing to the general public his "new" and great "discoveries", before his colleagues have had time to pass judgment, is not only a menace to the best interests of his own calling, but to society in general. Yet such persons may all be "regulars", "in good standing", honored members of state and national associations. The fact that they have their M. D. from a "regular" college of medicine appears to place them beyond reproach. They are not quacks like eclectics or homeopathists etc., but broad minded persons free from the narrowness of school. Such at least is the silent verdict of their colleagues. It seems to justify the statement of a careful observer who is very slow to condemn, that "the physicians' ethics is the almighty dollar."

In pharmacy the general drift is much the same. If the status of our calling were judged by the pages of ninety percent of our drug journals, it might be interpreted as being in a feverish "struggle for publicity." Advertisements, either the straight-forward ad or the reading notice, seem to make up even the dreams of the members of a "down trodden calling." That some of the results are comparable to nightmares is passing but lenient judgment. How many druggists have pondered over the suggestive vignette heading the column of the "struggle for publicity" in one of our new journals: a trio of cackling geese? But there is a more serious phase to this question.

Competition, far from being the soul of business, is in this case its cancer. It breeds foul business methods, exaggeration of virtues, claiming of virtues where there are none, substitution and adulteration, bogus and fraud, counter-prescribing and self-dispensing, free dispensaries and the department store, ten cent prescription drug stores, etc. Those journals which are constantly supplying "tips on advertising" seem to forget that this proceeding carried to its logical conclusion is not only nauseating but carries with it the element of self-destruction. Our standing army of advertisers are sucking the life-blood out of business, just as the standing armies of Europe consume much of the best energy of the human race. Neither produce, both consume. Both are evils from the economic as well as the moral standpoint. That this moral standpoint is not an imaginary one is evidenced by the recent laws passed against unfair competition in Germany, also by the supplication from the Agricultural Department at Washington to prevent the analyses of the government chemists from being grossly distorted by unscrupulous advertisers so as to produce the opposite effect from that which was intended.

These remarks will no doubt be brushed aside by many with the judgment: "pessimistic". Such persons the writer would recommend to attend the meetings of our state and national associations and listen to the remarks made by practicing pharmacists about the gloomy future which they are facing.

Scientific Restoration. When Prussia had been humiliated by Napoleon to a degree which seemed to forever wipe it from the face of Europe as a state, the Prussian ministry laid the foundation of its reorganization by the establishment of a new university at Berlin to which were called many of the leading minds of Germany. Prussia to-day is not only the first state of the German Empire, but its statesmen have figured foremost in European politics and its nine universities have attracted the intellectual youth of the world. Such a power have these as well as other German universities become that even English manufacturers are attributing Germany's superiority in industrial activity to the scientific spirit that pervades its industries. The result is felt not only in the factories in which are employed hundreds of men with university training, but throughout the commercial world.

In the far Orient, Japan has taught the world the same lesson. In commenting upon the Calendar of the Imperial University of Japan in Tokio for 1894—'95 a writer makes the following statement: "To study this modest pamphlet in the perspective of the past quarter of a century is to understand largely the secret of Japan's life and power on the threshold of the year 1896."

If within a century science and culture have given Germany the universally acknowledged supremacy in the intellectual world and are causing fear and trembling in the once supreme commercial nation of the British Isles; if the same factors working in a semi-barbarous nation for only a quarter of a century are causing the western commercial world to glance with suspicious eye westward across the wide Pacific, what may not we expect if we are to adopt them as our motto and watchword. Commercial remedies have been tried ad nauseam. The salvation of pharmacy like that of any calling that demands more than manual labor lies in the highest possible education of its ranks: not the training of the shops primarily, such as the English manufacturer has given his apprentice to his sorrow, but the broad university education which the German manufacturer, e. g., demands of his chemist.

Though, probably less has been said and written about **pharmaceutical education** during the past year than during the years just preceding, fully as much has been actually accomplished for advancement. Both Old and New England have quietly but boldly stepped forward. Those who had modelled their courses after Bloomsbury Square will now have to remodel them to keep up with the times. Inasmuch as this course was considered the model course for England and even for schools outside the British domain, this change is significant.

Whereas Americans are indulging in comparative rest for the moment with regard to the apprenticeship system, Europe is being stirred by the same problem. In France the suggestion by the government to reduce the apprenticeship and increase the time spent at college is producing the same clamor on the part of the pharmacists that the suggestion of its abolition produced in this country. The editor of the London Pharmaceutical Journal in commenting on the inadequacy of the old course at Bloomsbury Square says of the apprenticeship system: "But that system in its entirety has proven incompatible with the trend of modern progress, and it has become necessary to find some other system than apprenticeship, whereby the efficient training of pharmacists may be ensured." Dr. Sprinfeld in his brochure that has created so much excitement throughout Germany, in commenting on the present position of pharmacy in Germany claims "die deutsche Apotheke ist zur Heranbildung von Lehrlingen unzureichend geworden."

Every one seems to recognize that the apprenticeship in its old form is doomed. Those who have advocated its abandonment can afford to remain quiet when college after college is dropping the experience clause for graduation. When the action of colleges has become uniform in this respect then it will be time to combat the practice of druggists to take apprentices, if this should still be necessary. Those who still cling to traditions must realize the modern trend of professional and technical education. The few who still blow away at the trumpet of resurrection do so from sheer ignorance or from "intelligent prejudice." Let them blow: *Caesar morituri salutamur.*

Nothing will tend more to redeem pharmaceutical education and pharmacy than to submit the pharmaceutical student to the broadening influence which results from daily intercourse with students in other departments of science, arts and letters. Whereas not many years ago the independent colleges of pharmacy were ridiculing the attempts at pharmaceutical education made by universities, some of the oldest colleges are to-day seeking affiliation with larger and broader institutions of learning. The danger of association by name and by name only, without the inculcation of the true university spirit and the broadening effect produced by the constant intercourse with those of other departments of learning should not be overlooked. If affiliation of colleges with universities is to mean that the pharmaceutical students must attend the concerts of the university glee and banjo clubs, the games of the foot-ball eleven, and make known their presence by their yell, if affiliation is to mean this and little more, then we may with good reason regret such educational sham.

A German literary journal summarized the present status of German pharmacy by stating: "Es handelt sich . . . . darum . . . . ob die Pharmacie endlich das Recht erlangen soll, an den Culturaufgaben der Menschheit mitzuarbeiten." The editor of a pharmaceutical weekly recently burst forth with the words: "Erlösen wir die Pharmacie aus den unwürdigen Banden der Halbbildung." These utterances apply to America as well as to Europe. No education can be too good for the pharmacist of the future.

The same reader who brushed aside the earlier statements of the writer as pessimistic, if he has had the patience to plod his way through the succeeding paragraphs, will no doubt be inclined to dispose of the above by designating them as idealistic, impractical and impossible. Nothing is impossible to him who wills.

The advocates of the **metric system** possibly have received as many set-backs as any missionary to a foreign land. But they are not discouraged and continue with renewed energy their missionary work among the intellectually conservative. The remark by a representative from Kentucky that he had made the remarkable discovery that whisky could not be measured by the liquid measure of the metric system, may be taken in all seriousness by the conservative British headed by Sir Edwin Arnold, or as a good joke by the more humorous American, it will serve simply as a stimulus to combat both ignorance and intellectual prejudice.

It is impossible within the scope of an annual retrospect to even briefly review the natural sciences correlated to pharmacy. A year ago **bacteriology** seemed to call for special mention on account of the importance bacteriological remedies had acquired. The number of these preparations has increased, but the unfortunate case of Langerhans at Berlin gave rise to more comment than the improvement of bacteriological remedies or the publication of the first general scientific treatise on bacteriology from a purely biological and philosophic standpoint.

Physiological chemistry is also active in increasing our materia medica. Glandular therapy with its host of new remedies is at present the popular fad. Whereas physiological chemistry is active in the attempt to place these remedies as far and as fast as possible on a scientific basis, the medical quack has been quick to appeal to a morbid mental status of the public mind in advertising his remedies for all conceivable ailments. Every organ yields its own particular remedy, so there need be no fear of abuse any longer, because sheep, cattle and swine can readily supply the waste.

While the quack is sowing his seeds on a field well prepared by self medication with secret remedies commonly known and misnamed as patent medicines, physiological chemistry is going begging even at German universities. The only chair of physiological chemistry at a Prussian or Imperial University, namely that at Strassburg, which was vacated by the death of Prof. Hoppe-Seyler, has not yet been filled. Since then the chair at the University of Freiburg has also been vacated by the death of Prof. Baumann, a former student and assistant of Hoppe-Seyler.

While physiological chemistry appears to be neglected, **physical chemistry** is having its "boom". The past year has witnessed the migration of Prof. Van't Hoff from Amsterdam to the University of Berlin where he is expected to conduct research in his particular branch. We have also witnessed the dedication of a new building to be devoted exclusively to physical chemistry at the University of Goettingen, where only six years ago Dr., now full Professor and Director Nernst, a former student of Arhenius and Ostwald, habilitated himself as privat-docent. Prof. Ostwald also is to have a new institute at the University of Leipzig. Such is the rapid progress this branch of chemistry has outwardly made in recent years, not taking into consideration the erection of electro-chemical institutes at polytechnicums and technical schools. Pharmacy has been touched but little thus far by both branches of chemistry. It is true that at a few schools a laboratory course designated physiological chemistry is given, but the performance of a few analytical physiological-chemical manipulations, such as are called for in the rudimentary testing of urine and the like, can hardly be called a course in physiological chemistry.

Several university schools offer courses in physical chemistry to their advanced students. Although these courses are of greater significance, the most important work in this direction lies in the application of physico-chemical as well as physiological methods to the study of pharmaceutical problems. To have supplied a scientific theory for the explanation of the antiseptic, toxicological, etc., action of medical chemicals is an achievement of the past year that deserves mention in a pharmaceutical retrospect of the year 1896.

It may be said that such work lies without the province of pharmacy and should not be encouraged in an educational pharmaceutical institution. Such arguments, which are advanced not only in this country but in Germany as well, are on the same plane with the statement that the pharmaceutical student can be educated out of his profession. Both are the saddest comment ever made by pharmacists with respect to their own calling.

If the training of the pharmacist is to lie simply in the direction of counting ready made pills or tablet triturates, this argument holds good, but then it is also self destructive. There is no need whatever of training men for work of this calibre. The physician can count tablets as well as the pharmacist and makes liberal use of his ability, to his own satisfaction and that of the patient. But if the pharmacist is to have a scientific insight into his proper duties, no education is too good, and no research too scientific. If pharmacists are to have a hand in the evolution of the "Kulturaufgaben" that now interest mankind, they must give as well as take, and must give freely. To lead a parasitic existence, to digest merely that which is conveniently supplied by the general sciences, is unworthy of any calling, no matter how humble it may be.

New Recruits. Fortunately there is a small number of younger men whose ideas are not limited by the horizon of the colonial drug store and its present outgrowth, but who although willing to be stigmatized heretics and cranks, are not willing to surrender their ideals. The past year has again added several to this small army. Let us hope that they will not be discouraged, but with the trowel in one hand and the sword in the other fight for the redemption of their beloved pharmacy.

In Memoriam. While we have reason to rejoice over the advent of new recruits, we should not be forgetful of the veterans who have ceased to battle. Whereas a year ago the recorder of pharmaceutical events was fortunate in being able to state that none of the leading pharmaceutical scientists had been taken from their fields of activity by death, this is not the case at the close of the year 1896. This year has spared pharmacy no more than the branches of science correlated to it. Again and again it became a painful duty to record the demise of scientific workers directly connected with pharmacy or who indirectly helped materially in shaping its destinies.

Pharmaceutical Literature. Considerable activity has been displayed during the past few years in the writing of pharmaceutical text-books. In place of a practical monopoly, which existed formerly in this country, a healthy competition has set in that has been productive of much good. One thing, which American publishers as well as authors have not yet sufficiently learned, is a greater division of labor. No American treatise on pharmacy can compare in this respect with some of the German publications in the same field.

Pharmaceutical journalism has undergone no material change during the past year. The several new journals that have sprung up seem to be indicative but of the usual growth. The Pharmaceutical Review is not one of these new journals as some of its contemporaries seemed to be anxious to inform the public. The change from the German to the English language, which seems to have caused this rumor, has received nothing but favorable comment. It is our pleasant duty to thank all those who in one way or another have during the past year assisted in the maintenance of this journal. The Review extends to all its patrons and friends the greetings of the season.

E. K.

ORIGINAL CONTRIBUTIONS.

Native Drugs of Ceylon.

By Prof. *Rodney H. True.*

Among the exhibits from Ceylon at the Columbian Exposition in Chicago was a collection of crude Singhalese drugs. At the close of the Exposition, these specimens became the property of the School of Pharmacy of the University of Wisconsin and were placed in the pharmacognostical collection. Since in great part these drugs are unknown to occidental medicine and pharmacy, the writer hopes to submit from time to time, as occasion may permit, the results of a more or less thorough anatomical study of these drugs. The quantity of each being small, a chemical investigation of the constituents is unfortunately out of the question.

The underlying principles of Singhalese medicine are briefly detailed in the official catalogue of the Ceylon exhibits. Since this has already found its way into American print[1] without essential change, the reader is referred to that place of publication.

The drugs are derived from plants indigenous in Ceylon or growing wild there. Several of the plants enumerated in the list are of western origin, being introduced in the East where they found a congenial home and in time were able to maintain themselves wild. Among these may be mentioned *Cissampelos Pareira* L., formerly erroneously believed to be the source of Pareira brava root. This plant is a native of the West Indies, in all probability. *Cassia alata* L. is another example. *Cardiospermum halicacabum* L. is regarded as indigenous in sub-tropical North America, it being also a common plant in the south-western part of the United States. Several natives of Asia found in our list have been introduced into the New World where they have found a more or less extended distribution. In this class belong the following plants observed in South America and the West Indies: *Abrus precatorius* L., *Aerua lanata* Juss., *Cassia fistula* L., *Desmodium triflorum* DC., *Eclipta erecta* Lamk., *Hydrocotyle Asiatica* L., and *Wedelia calendulacea* Less. *Cyperus rotundus* L., nut grass, is a common and troublesome weed in the southern and south-eastern parts of the United States. *Eleusine Indica* Gaertn., the dog's tail or wire grass, is likewise abundant in the southern United States.

Bassia longifolia L.

The genus *Bassia*[2] of the *Sapotaceæ* includes trees of tropical Asia having a milky juice, leathery leaves, quite large flowers and fleshy, berry-like fruits which in some species are edible. *B. latifolia* L., *B. longifolia* L., *B. butyracea* Rxb., *B. Parkii* Hook. and others may be mentioned. The seeds contain no endosperm but the large fleshy cotyledons have an abundant supply of oil which serves many purposes and goes under many names. Some species yield a guttapercha of useful quality.

Bassia longifolia[3] L. is a tree reaching a height of 40 feet; all the young parts rusty tomentose. Leaves lanceolate, narrowed at both ends, glabrous, distinctly nerved; stipules linear; petioles 1 to 2 inches long, tomentose, in dense clusters near the ends of the branches. Is common in Western Mysore, Malabar, and the Cicars as well as in Ceylon. It goes under several native names. "Moha" in Hindustanee, "Maua" in Bengalee, "Illupai" in the Tamil language, "Mi" in Singhalese.

This species as well as *B. latifolia* and *B. butyracea* have long been known. Susruta[4] describes the spirituous liquor prepared from the flowers as heating, astringent, tonic and appetizing. Inscriptions[5] on copper plates discovered in the district of Etawah dating from A. D. 1103 and 1174 record grants of villages to Brahmins by the kings of Kanauj and enumerate the imports that were to be levied. These include taxes on mines, saltpits, and the trade in precious metals, also on "mahwa" (*Bassia*) and mango trees and on cuscus grass (vetti-ver). Ibn Batuta[4] who visited India A. D. 1332 mentions "Mahwa" and remarks that the flowers when dried in the sun taste like figs.

Bassia longifolia receives the following mention in the official catalogue of the Courts of Ceylon:

"The timber is heavy, close, and straight grained, very flexible and durable. It is valued for keels of ships, and for planking below the water-line; it is also used in the construction of carts and for bridges." p. 112.

In Sanscrit, the *Bassia* species are referred to collectively under several names: "Madhuka" and "Madhudruma", honey tree; "Madhupushpa", honey flower; "Madhusakha", sugar flower; and "Kolaphala", fruits of the Kols, a tribe subsisting in great part on the flowers of the *Bassia*, collected and dried by them. These trees afford a number and variety of useful products. The thick, red-colored bark with a rough, brown surface is used in a decoction as an astringent. The milky juice of the bark is prescribed in India as a remedy for phlegm and rheumatism, as an astringent and promoter of suppuration. A kind of guttapercha is yielded by several species. The bark of *B. longifolia* yields three percent of caoutchouc when extracted with benzol. In general, the *Bassia* guttapercha[6] is hard at ordinary temperatures, but softens in hot water and can then be moulded by the hand. It is best mixed in equal proportions with the ordinary article.

The trees[7] produce cream colored flowers in March and April and in August a reddish-yellow fruit one to two inches long, which contains from one to four light brown seeds follows. These flowers are collected and dried and are consumed as food especially in the agricultural districts of India. At first sight the dried flowers resemble raisins, but on closer inspection they are found to be fleshy, sticky, compressed, hollow bodies about six-tenths of an inch long and nearly as broad. When soaked up they become nearly globular and the numerous anthers are seen attached by very short filaments to the inside of the corolla. The taste is sweet and acid. The fleshy substance, consisting mainly of parenchyma, is found to contain crystalline masses of sugar. The flowers of *B. longifolia* were found by Riche and Remont[8] to contain 60 percent of fermentable sugars and 8.5 percent of crystallizable sugar. As would be expected, this source of fermentable material is not left unutilized. A spirituous liquor, "Madhu-madhaví" or "Madhvásava", described in Susruta, is from *Bassia* flowers. In the Bengal districts of India where the spirit is made, the fermentation takes place in earthen vessels containing from ten to twenty gallons of fluid and as many *seers* (1 *seer* = 2 lbs.) of the flowers, and is continued from two to seven days according to the temperature. The stills are of the rudest pattern. On the average, one *maund* (80 lbs.) of flowers yields 2.12 gallons of proof spirit. This is rich in fusel-oil, the ordinary native distilled article containing as high as 0.4 percent. From the sugary flowers a coarse kind of molasses is prepared.

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[1] H. Kraemer, Am. Journ. Pharm., 1894, p. 530.

[2] J. Moeller in Real-Encyclop. d. gesammten Pharmacie. 1887. II, p. 165,

[3] Warden, Dymock and Hooper. Pharmacographia Indica, II, p. 355; also, Kraemer, Am. Journ. Pharm., 1894, p. 535.

[4] Pharmacog. Indica II, p. 355.

[5] Flückiger and Hanbury, Pharmacographia, 2d ed., p. 728.

[6] Heckel and Schlagdenhaufen, Compt. Rend. C. (1885), p. 1238.

[7] Pharmacogr. Indica, II, p. 261,

An analysis of the air-dried flowers of *B. latifolia* by Church[9] showed cane sugar, 3.2 percent; inverted sugar, 52.6 percent; ash, 4.8 percent; cellulose, 2.4 percent; albuminous substances, 2.2 percent.

The seeds of *B. longifolia* and of related species are very rich in a fatty oil which is obtained from them by expression. This fat melts at 25.3° C. and according to Oudemanns[10] consists of 79 percent of stearic acid. It is used by the natives for very many purposes. It serves as a food, being eaten in the manner of butter; soaps are prepared with it; it is used in making pomades, and furnishes a suitable material from which to make candles. An analysis[11] of the seeds of *B. longifolia* by E. Valenta yielded the following results: Fat, 51.14 percent; alcohol extract, 7.83 percent; tannin, 2.12 percent; starch, 0.07 percent; mucilage, 1.65 percent; sol. albumen, 3.60 percent; extract, 15.59 percent; insol. proteid, 4.40 percent; total ash, 2.71 percent.

The seeds of *Bassia longifolia* are at hand and since as far as the writer has been able to ascertain no particular attention has been paid to its microscopic structure, a somewhat detailed description follows (Fig. I, 1).

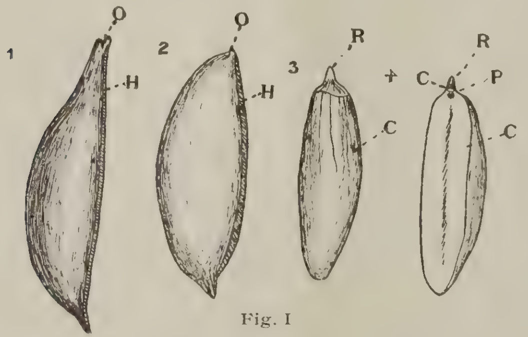

Fig. I

The seeds before us are from 3 to 4.5 cm. long and about 1 cm. wide and have a smooth, shining, chestnut colored shell. They are very narrowly elliptical, at each end prolonged into a more or less marked beak-like projection. The micropylar end is somewhat broader and is marked by a slight notch near the tip of the beak. Owing to mutual pressure in the fruit, the seeds are usually more or less compressed laterally, one side generally being flattish, the other convex. The hilum or region of attachment extends along the inside edge of the seed, as a long, pale scar with a roughish surface running nearly the entire length.

Other seeds present under this name are of a somewhat different appearance. They are much broader, reaching with the above length a width of 1.5 cm. The beaks are shorter, being merely short projections at the ends. In color, this kind is lighter than the narrower form described above and less shining. The following descriptions of structure are drawn from the narrower form which makes up the greater part of the specimen.

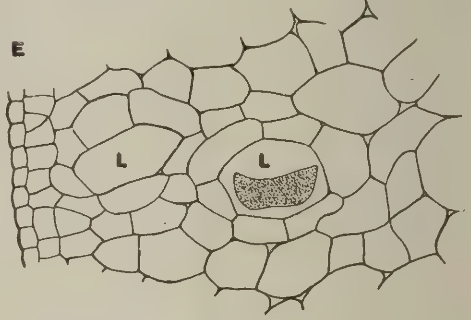

Fig. II.

The shell is thin, hard and brittle, thickened somewhat along the hilum. The delicate, inner integuments of the seed partly adhering to the embryo and in part coming away with the shell, are of a light, brick-red color traversed by pale veins. The seed contains no endosperm, the dicotyledonous embryo in the dried specimen scantily filling the shell. The fleshy cotyledons are straight and show no veining; in cross section they are convex on the outer faces, concave on the inner faces. The radicle is short, the plumule hardly to be seen. The cotyledons cut in the brittle, waxy manner characteristic of firm oily seeds. The exposed surfaces are yellowish-brown in the dried seed and of a dull appearance. Each cotyledon is traversed lengthwise by three veins, one median and larger, two lateral when seen in transverse section.

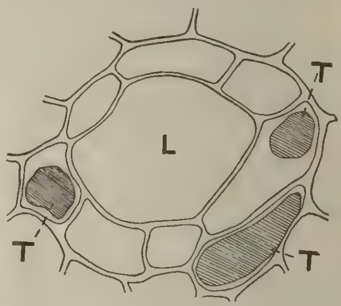

Fig. III.

When examined microscopically in cross section, the cotyledons are seen to be almost entirely composed of parenchyma cells filled to a great degree and much obscured by oily masses firm at the usual temperatures. Certain parenchyma cells scattered in abundance throughout the tissue of the cotyledons, present in great number near the periphery, attract attention through a slight yellowish coloration. They are filled completely with a waxy, homogeneous content that gives a very characteristic reaction with reagents. All points to the presence of considerable tannin, the masses occupying the particular cells in question appearing to be saturated with it. This occurrence of tannin in considerable quantity (as also appears from the analysis above) in a seed is of some interest since tannins[12] are rarely found in seeds and then in small quantities. In treating with the usual reagents, the masses occupying the cells are apparently not affected beyond a change of color, in no reagent being dissolved. To render the sections clearer by removing the fatty cell contents, the sections were soaked in sulphuric ether, followed by ordinary alcohol and mounted in glycerine. Concentrated sulphuric acid dissolved the cell walls but the contents in question appeared to be unaffected beyond assuming a yellowish-brown color. Treatment with ferric chloride and ferric sulphate brought out a bluish-black color. When treated with concentrated sulphuric acid, the walls of the tannin sacs dissolved without evidence of modification, thus indicating cellulose.

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[8] Journ. d. Pharm. e. d. Chim., 1880.

[9] Gardner's Chronicle, Jan. 16, 1886; Am. Journ. Pharm., 1886, p. 250.

[10] J. Chim. Min., 1863, p. 333.

[11] Dingl. Polyt. Journ., Vol. 251, p. 461; Am. Journ. Pharm., 1885, p. 108.

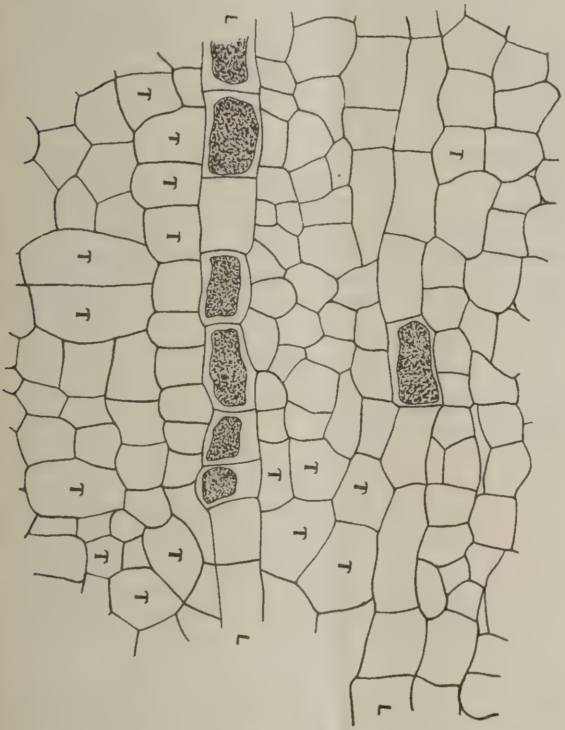

Fig. IV.

In the transverse section of the cotyledon, certain cells of unusual diameter generally surrounded by smaller cells of a more or less markedly flattened outline are seen. Thus an appearance strongly suggesting a glandular structure is seen. These cells like the tannin sacs are more abundant toward the periphery. They are occupied by a dusky, palish, somewhat granular mass, which retains its form on being freed from the cell. In longitudinal section, these larger elements are found to be cells of usually greater length than the surrounding tissues, arranged in a longitudinal series that may extend for considerable distances in an approximately straight course through the parenchyma. A granular mass occurs in each cell of the series. The conduct toward reagents indicates that these numerous rows of large cells belong to the already considerably developed latex system of the embryo. This agrees with the results of Wilhelm[13] who finds that the latex in the members of the *Sapotaceæ* studied is always in closed sacs which are always surrounded by parenchymatous elements and differ from these fundamentally only in their contents. No evidence that these rows of cells branch or coalesce was to be found. We have here in the embryo apparently an already well developed system of latex reservoirs.[14]

The epidermis bounding the cotyledons is made up of small, longitudinally elongated, brick-shaped cells. The walls are thin, the outer surface is provided with a thin cuticle. Not rarely the epidermal cells are found filled with the waxy, tannin-containing mass above described. The presence of such a body in the epidermis is a rather unusual occurrence.

The fibro-vascular bundles are small, the xylem being reduced to half a dozen elements or less. No thick walled mechanical tissue accompanies the bundle.

Occasionally, fragments of the adhering seed coats appear in the section, but any description of them in view of the absence of younger stages of development would be of little value.

Explanation of figures.

I. 1. Side view of seed of *Bassia longifolia* L. Longer form. Natural size.
  2. Side view of seed of shorter form. Natural size.
  3. Side view of embryo removed from shell. Natural size.
  4. Embryo with one cotyledon removed. Natural size.
    O. Micropylar opening.
    H. Hilum.
    R. Radicle of embryo.
    C. Cotyledon of embryo.
    C′. Point of attachment of cotyledon removed.
    P. Plumule.

II. Portion of transverse section of cotyledon. Magnified 180 diameters.
  E. Epidermis of cotyledon.
  L. Latex reservoirs.

III. Transverse section of latex reservoir in detail. Magnified 300 diameters.
  T. Tannin-containing cells and the masses in the same.
  L. Latex reservoir.

IV. Portion of longitudinal section of cotyledon. Magnified 180 diameters.
  L—L. Latex-containing cells in two series.
  T. Tannin-containing cells.

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Rectification of Turpentine Oil.

By *Edward Kremers.*

(Report of Research-Committee G, U. S. P. Revision.)

European pharmaceutical treatises have as a rule recommended the rectification of turpentine oil for pharmaceutical use. The U. S. Pharmacopœia, in its last edition, has followed the German Pharmacopœia and has adopted a rectified oil in addition to the commercial article. Process as well as properties of product are practically the same as described in the Ph. Ger. ed. III.

Turpentine oil has been rectified frequently, yet there appears to be no record of a detailed study of its rectification. The various pharmacopœias place specific gravity and boiling point of the rectified product within narrower limits than those of the crude commercial article. Any one who has rectified turpentine oil with lime-water or milk of lime, or with water pure and simple, well knows the difference in the odor between the recently rectified product and the crude oil. This may be deemed sufficient and for all practical purposes very likely is. To make a detailed study of such process simply or primarily for its own sake, possibly would not have tempted the writer any more than any other person. Inasmuch as specimens of pure natural pinene were desired for other purposes, the question, however, seemed of sufficient interest to meet at least secondary consideration. The results obtained are not totally devoid of interest and may merit publication for the benefit of the U. S. P. Revision Committee.

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[12] H. Trimble. The Tannins, I, 1892, p. 18.

[13] Wilhelm—Cited in De Bary's Comparative Anatomy of the Phanerogams and Ferns, p. 151.

[14] De Bary—ibid., p. 191.

Several gallons of commercial American turpentine oil were purified according to a slight modification of the process given in the latest editions of the U. S. and German pharmacopœias. The sp. gr. of the crude oil was 0.872 at 20°. In a 100 mm. tube it turned the plane of polarized light 10.13° to the right, hence $[\alpha]_{\mathrm{D}} = +11.616°$.

In order to rectify the oil, 1000 ccm. of the commercial article were shaken with an equal volume of milk of lime. The mixture was set aside for at least twelve hours. It was then distilled with water vapor, fractions of 200 ccm. each being collected. About four-fiths of the oil was thus recovered, the last fifth being rejected.

Table I.

	Fraction.	Sp. Gr. at 20°.	α for 100 mm. tube.	$[\alpha]_{\mathrm{D}}$
Experiment I.	1.	0.865	+10.540°	+12.184°
	2.	0.867	+10.520°	+12.133°
	3.	0.868	+10.500°	+12.095°
	4.	0.8682	+10.098°	+11.633°
Experiment II.	1.	0.864	+12.158°	+14.180°
	2.	0.866	+10.720°	+12.297°
	3.	0.8702	+ 9.940°	+11.429°
	4.	0.8722	+ 9.340°	+10.700°
Experiment III.	1.	0.864	+12.070°	+13.968°
	2.	0.8641	+11.508°	+13.315°
	3.	0.8647	+10.583°	+12.237°
	4.	0.8697	+ 8.851°	+10.017°
Experiment IV.	1.	0.8652	+12.050°	+13.915°
	2.	0.867	+11.060°	+12.756°
	3.	0.8703	+ 9.810°	+11.271°
	4.	0.8748	+ 9.036°	+10.329°

In one instance, however, the oil was not collected in fractions. The four-fifths recovered by distillation with water vapor had a pleasant odor. Dehydrated with exsiccated sodium sulphate its sp. gr. was 0.864 at 20°. In a 100 mm. tube it turned the plane of polarized light 10.558° to the right, hence $[\alpha]_{\mathrm{D}} = +12.177°$. It will thus be seen that a rectification over milk of lime with a recovery of but four-fifths resulted in a brilliant oil, of pleasant odor, with lower specific gravity and higher rotatory power.

Most of the oil, however, as already stated, was recovered in fractions. The difference in specific gravity and rotatory power of these fractions in four sets of experiments will readily become apparent from the first table.

From these results it becomes apparent that corresponding fractions were similar in properties, also that with diminishing volatility of the fractions with water vapor there is a slight increase in specific gravity and a somewhat greater diminution of rotatory power.

Inasmuch as these fractions had not been dehydrated it was of interest to ascertain what effect moisture had upon the sp. gr. and rotatory power of the same. The fractions from experiment II were therefore dehydrated with exsiccated sodium sulphate. As will be seen from the tabulated results (Table II) the differences are but very slight.

Table II.

Fraction.	Sp. Gr. at 20°.		$[\alpha]_{\mathrm{D}}$	
	Before Dehydration.	After Dehydration	Before Dehydration.	After Dehydration.
1.	0.864	0.867	+14.180°	+14.141°
2.	0.866	0.868	+12.297°	+12.503°
3.	0.8702	0.873	+11.429°	+11.422°
4.	0.8722	0.8733	+10.700°	+10.706°

It being demonstrated that the corresponding fractions of the various experiments were so nearly alike they were mixed, dried and fractionated. Thus fractions 1 of experiments I, II, III and IV were mixed and marked hereafter fraction A., fractions 2 of experiments I, II, III and IV were mixed and marked fraction B, the others C and D respectively. The result of the fractionation of fractions A, B, C and D are tabulated (Table III), the yield at the various temperatures being indicated in cubic centimeters.

Table III.

	—154°	154—155°	155—156°	156—157°	157—158°	158—159°	159—160°	160—161°	161—162°	162° +
A.	101 ccm.	162 ccm.	188 ccm.	99 ccm.	51 ccm.	31.5 ccm.	15.3 ccm.	8.5 ccm.	12 ccm.	38 ccm.
B.	25.5 "	87.5 "	139 "	211.5 "	92 "	82 "	30 "	15.5 "	15 "	55 "
C.	17 "	37 "	99 "	141.5 "	117.5 "	114 "	52.5 "	24.5 "	39 "	104 "
D.	11 "	19 "	49 "	68.5 "	127.5 "	115.5 "	37.5 "	30.5 "	36 "	116.5 "

The table appears selfexplanatory and, therefore, further comment is unnecessary. In order to ascertain whether like fractions possessed similar specific gravities and rotatory power fractions 155—156° A, B, C and D and fractions 156—157° A, B, C and D were examined with regard to these constants. The results are given in table four.

Table IV.

	155—156°.		156—157°.	
	Sp. Gr. at 20°.	$[\alpha]_D$	Sp. Gr. at 20°.	$[\alpha]_D$
A.	0.8636	+14.594°	0.864	+13.345°
B.	0.8622	+14.633°	0.863	+13.360°
C.	0.8640	+13.987°	0.865	+13.272°
D.	0.8660	+13.313°	0.8643	+13.387°

Inasmuch as the differences are surprisingly slight, corresponding fractions were poured together in order to simplify refractionation. These four fractions —154° A, B, C and D were united and marked simply fraction —154°; fractions 154—155° A, B, C and D were united and constituted fractions 154—155° without further distinctions etc. The refractionation was conducted very carefully with a column, an Anschuetz thermometer being used. The barometric pressure was also noted before and after refractionation of each fraction. The barometric pressure varied but little: the minimum pressure being 733 mm. at 27°, the maximum pressure 737 at 24°. A detailed record of the barometric pressure for each fraction therefore appears unnecessary. The results of this refractionation are enumerated in the following table. This table also is largely selfexplanatory. Attention, however, should be called to the fact that the differences in the boiling points of corresponding fractions of table III and table V are due to the use of an ordinary, long thermometer in the first fractionation; and a short Anschuetz thermometer, the mercury of which was entirely in the vapor, in the second fractionation.

Table V.

Boiling Point of Fractions.	Yield.	Sp. Gr. at 20°.	α for 100 mm. tube.	$[\alpha]_D$
—157°	74 ccm.	0.864°	+13.788°	+15.958°
157—158°	190 "	0.864°	+13.688°	+15.833°
158—159°	950 "	0.864°	+13.343°	+15.439°
159—160°	425 "	0.865°	+11.395°	+13.179°
160—161°	228 "	0.866°	+ 9.796°	+11.317°
161—162°	175 "	0.867°	+ 9.325°	+10.755°
162—163°	90 "	0.868°	+ 7.536°	+ 8.681°
163—164°	43 "	0.870°	+ 6.445°	+ 7.408°
164—166°	67 "	0.873°	+ 6.286°	+ 7.166°
166—168°	68 "	0.876°	+ 5.788°	+ 6.607°
168—170°	70 "	0.879°	+ 5.401°	+ 6.144°
170—174°	42 "	0.882°		
174—178°	30 "			
178—182°	25 "			
182—186°	16 "			
186—190°	9 "			
190—194°	5 "			
194—198°	5 "			
198—202°	5 "			
202°+	148 "	0.997°		

The conclusions which these figures permit are not difficult to draw. The work of this laboratory may in the near future call for the preparation of more pure pinene. Before making any suggestions the writer, therefore, prefers to wait until more evidence of the above kind is at hand. One point, however, which is independant of the purification of the oil, the writer should like to emphasize, viz. that the rectified oil will readily undergo the process of so-called resinification under the ordinary conditions of storage on the shelves of the drug store. Evidence that even the very best of the above fractions will undergo rapid change under such conditions is at hand and may be utilized later. The writer is indebted to Mr. A. H. Miles for the experimental work involved in securing the above data.

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TRANSLATIONS.

Reagents and Reactions known by the Names of their Authors.*

Based on the original collection by *A. Schneider*, revised and enlarged by Dr. *Julius Altschul.*

Luecke's test for hippuric acid. Upon heating the residue obtained by boiling to dryness a mixture of hippuric and concentrated nitric acids, a strong odor of nitrobenzene is developed.

Lugol's solution for identifying albumen in the urine is a solution of iodine in potassium iodide which has been acidulated with glacial acetic acid.

Lunge's test for nitrous acid depends upon *Griess'* reaction (q. v.) with sulphanilic acid and α-naphthylamine, which according to *Lunge* are kept on hand dissolved in dilute acetic acid. Solutions containing nitrous acid are colored red with this reagent. For quantitative determinations the following is used:

> **Lunge & Lwoff's** test for nitrous acid. Colorimetric test by means of a solution of 0.1 g. α-naphthylamine in 100 ccs. water, 5 ccs. glacial acetic acid and 1 g. sulphanilic acid in 100 ccs. water. The normal solution contains 1/100 mg. nitrogen from nitrites per cc. (0.0493 g. sodium nitrite are dissolved in 100 ccs. water and 10 ccs. of this solution diluted to 100 ccs. with concentrated sulphuric acid). Place in each of two cylinders 1 cc. of the reagent and 40 ccs. of water; then add to one 5 g. of crystallized sodium acetate and to the other 1 cc. of a normal solution of the substance to be tested, and compare the colors.
>
> **Lunge & Lwoff's** test for nitric in the presence of nitrous acid; a colorimetric determination by means of a solution of 0.2 g. brucine in 100 ccs. of pure concentrated sulphuric acid. Mix 1 cc. of normal solution (10 ccs. of a solution of 0.0721 g. KNO_3 in 100 ccs. water are diluted to 100 ccs. with concentrated sulphuric acid), and 1 cc. of the solution to be tested, each with 1 cc. of brucine solution; dilute each sample to 50 ccs. with concentrated sulphuric acid, heat to 70°—80° C., cool after the solutions have acquired a sulphur-yellow color, and compare the intensities of the colors in suitable glass cylinders.
>
> The above normal solution contains per cc. 1/100 mg. nitrogen from nitrates.

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* Continued from Vol. 14, p. 273.

Lustgarten's reactions for iodoform.

1. Upon warming 1—2 drops of an iodoform solution with a little phenol and caustic potash, a red substance is formed, dissolving in alcohol to a red solution.

2. Dissolve 0.1 g. resorcin and a piece of sodium in 5 ccs. alcohol. 5 drops of the resulting green solution are mixed in a test tube with the ethereal iodoform solution, and the ether carefully evaporated. A cherry-red color results, which is destroyed by acids but restored by alkalies.

Lustgarten's reaction for naphthol. See *Wolff's* reaction.

Lux's test for fatty oils in mineral oils. In a paraffin bath kept at 200—210° C., heat for 15 minutes two samples of the oil contained in test-tubes, to one of which has been added some caustic soda, to the other some metallic sodium. Even if the specimen contains only 2 p. c. of fatty oil, one or the other sample, but generally both, will form a stiff jelly.

Lyon's mixture for shaking out strychnine and brucine consists of 3 volumes of ether and 1 volume of a mixture of 88 ccs. chloroform, 12 ccs. alcohol and 2 ccs. ammonia.

MacLagan's cocaine test. 50 ccs. of an approximately 0.1 p. c. solution of a cocaine salt are treated with 2—3 drops of ammonia, and the walls of the glass vessel rubbed vigorously with a glass rod. Pure cocaine separates out in crystals; a milky turbidity indicates the presence of amorphous alkaloids (isatropylcocaine).

Maisch's test for curcuma. See *Houvier's* test.

Mandelin's reagent for alkaloids is a solution of 1 g. ammonium vanadate in 200 ccs. concentrated sulphuric acid. This reagent yields brown, red, or green colorations with alkaloids.

Mangini's reagent for alkaloids is obtained by treating 3 parts of potassium iodide and 16 parts of bismuth iodide with 3 parts of hydrochloric acid. A brown precipitate is formed with solutions of alkaloids; compare *Dragendorff's* reagent. The above reagent has the advantage over the latter of not becoming turbid when mixed with water.

Mann's reagent for water in alcohol, air, etc. 1 p. of molybdic acid is triturated with 2 p. of citric acid, the mixture fused, and when cool dissolved in water; filter-paper is then saturated with this solution and dried at 100° C. This blue paper becomes white through the absorption of water when exposed to moist air, or when dipped into alcohol or ether containing water.

Maréchal's test for coloring matter from the bile. Add 2—3 drops of tincture of iodine to an acid or neutral urine; in the presence of biliary pigments a chrome-green color appears. See *Smith*.

Marmé's reagent for alkaloids (potassium cadmium iodide). Add to a boiling concentrated solution of potassium iodide (4 p. KI in 12 p. water) cadmium iodide to saturation (2 p.), and mix this with a like volume of a cold saturated solution of potassium iodide. The concentrated solution is permanent; the weak one decomposes upon standing. With solutions of alkaloids, this reagent yields white to yellowish precipitates. (*Dragendorff*, Ermittelung der Gifte; *Hager*, Pharm. Praxis.)

Known also as *Lepage's* reagent.

Marque's test for sparteine. Sparteine sulphate warmed with one-third its weight of chromic acid, yields a green color through reduction of the latter; at the same time the penetrating odor of cicutin is developed.

Marsh's test for arsenic. By reduction with pure zinc and dilute sulphuric acid, arsenious hydride (arsine) is produced from solutions of arsenates or arsenites which must be free from oxidizing agents. If the arsine is passed through a red-hot glass tube, metallic arsenic is deposited on the cold portion of the tube beyond. Upon igniting the arsine and placing a cold porcelain plate into the flame, metallic arsenic is deposited upon the plate. (Concerning further tests, distinction from antimony, and precautious to be observed in manipulation, see *Fresenius*, Qualitative Analysis, and *Hager*, Pharm. Praxis.)

Davy's modification of the above consists in the use of sodium amalgam instead of zinc and sulphuric acid for the reduction of the arsenic compounds.

In *Himmelmann's* modification, zinc, iron, and concentrated ammonium chloride solution are used to accomplish this result.

Fleitmann's modification employs zinc and caustic soda or potash to liberate the arsine.

Masin's solution is a solution of potassium mercuric iodide of almost the same composition as *Mayer's* reagent (q. v.).

Masset's test for biliary coloring matter. See *Gmelin's* reaction.

Maugin's reagent for the microscopical examination of textile fabrics is an ammoniacal oxychloride of ruthenium (ruthenium red).

Maumené's reaction for distinguishing oils. Observe the rise in temperature which results when mixing the oil with concentrated sulphuric acid. Drying oils evolve much more heat than non-drying ones.

Maumené's test for glucose. Saturate woolen threads with a 33 p. c. solution of zinc chloride and dry. When moistened with a glucose solution and heated to 130°, the threads are colored brown or black.

Mayer's reagent for alkaloids (*Mayer's* solution, potassium mercuric iodide). 13.546 g. mercuric chloride and 49.8 g. potassium iodide are dissolved in water and diluted to 1 liter. With most alkaloids in weakly acid solutions this reagent yields whitish precipitates, which property permits its use in quantitative determinations. (*Dragendorff*, Analyse der Pflanzen; *Dragendorff*, Werthbestimmung; *Hager*, Pharm. Praxis.)

This reagent is also known under the names: *Delf's* reagent, *Planta's* reagent, *Tauret's* reagent, *Winkler's* reagent.

Méhn's reagent for albumin is a mixture of 1 p. phenol, 1 p. acetic acid and 2 p. of 90 p. c. alcohol; this solution precipitates albumen in the presence of nitric acid or sodium sulphate. The best method of proceedure is to add an equal volume of a saturated solution of Glauber's salt to the urine to be tested.

Melassez's solution for the preparation of *Teichmann's* hæmin crystals is a solution of the same specific gravity as blood (1.050—1.057); it consists of 3.75 p. mucilage of acacia, 1.875 p. sodium sulphate, 1.03 p. sodium chloride and 100 p. water.

Merget's test for the presence of mercury. A piece of gold-foil upon which metallic mercury has been precipitated (e. g., by means of stannous chloride from urine containing corrosive sublimate) is wrapped up first in tissue paper, and then in filter paper which has been saturated with an ammoniacal silver solution and subsequently dried. The whole is weighted down; in the presence of mercury, a brown color will be produced in a few minutes on the inside of the filter paper.

To prove the presence of mercury vapor, draw lines on filter paper by means of a glass rod moistened with an ammoniacal silver nitrate solution. These are darkened by mercury vapor.

Merget's test for moisture depends upon the use of salts which, like palladous chloride and mercurous chloride, show a different color when moist than when dry.

Compare *Mann's* reagent.

Merz's test for olive oil. Of two samples of olive oil, one is heated to 250° C. In the case of pure olive oil, the heated sample will appear much paler than the other.

Mesnard's reagent for identifying albumens: glycerine containing sugar, and fumes from concentrated hydrochloric acid.

Messinger's test for acetone. Solutions containing acetone yield iodoform when treated with iodine and caustic soda. For quantitative estimations, either the iodoform is weighed (*Krämer*), or the excess of iodine found by titration (*Messinger*).

Meyer's thiophene reaction. Thiophene and its homologues are colored blue by a solution of isatin in concentrated sulphuric acid.

Meyer's reaction for cod liver oil. Pure cod liver oil when shaken with $\frac{1}{10}$ its volume of a mixture of nitric and sulphuric acid (1:1), is first colored rose-red, then lemon-yellow. Other fish oils either do not show such a distinct transition, or give a brownish-yellow coloration.

Metzger's reaction for cocaine. Dilute aqueous solutions of cocaine salt after acidulating with hydrochloric acid yield orange-yellow precipitates with potassium chromate.

Millian's reaction for identifying linseed oil in olive oil. 40.0 g. olive oil are mixed with 60.0 g. of a 20 p. c. solution of potassium hydroxide in 70 p. c. alcohol, and heated on the water-bath until the alcohol has evaporated. The resulting soap is dissolved in warm water, the fatty acids are separated out by the addition of dilute hydrochloric acid, and these dissolved in 20 ccs. of 90 p. c. alcohol. If to this solution, after heating to 90°, 2 ccs. of a 3 p. c. alcoholic silver nitrate solution are added, a brown color will result if linseed oil was present in the olive oil.

Millian's modification of *Bechi's* test (q. v.).

Millon's reagent for albumens and phenols is prepared by dissolving mercury in an equal weight of fuming nitric acid (sp. gr. 1.4), first in the cold, later on by the application of a moderate heat, and then diluting the solution so obtained with two volumes of water. The reagent contains mercurous and mercuric nitrates as well as free nitric and nitrous acids. Albumens yield a brick-red precipitate with this reagent, especially after warming. Similar reactions are given by all compounds of the aromatic series that contain a single hydroxyl or methyoxyl group; a second hydroxyl or a nitro group in the ring change the reaction (*Nickel*). Thus resorcin yields a yellow, hydroquinone an orange, pyrogallol a brown coloration. Tannin and guaiacol are colored red, eugenol and vanillin violet.

Kintschgen-Gintl's modification of *Millon's* reagent: A solution of mercuric nitrate is treated with a little potassium nitrite, and the necessary quantity of nitric acid added just before using. The potassium nitrite must be freed from any carbonate it may contain (by passing nitrous acid through its solution).

Compare *Gallois'*, *Hoffmann's* and *Plugge's* reagent.

Millon's reagent for salicylic acid is a 10 p. c. solution of mercuric nitrate in dilute nitric acid; this yields an intensely red coloration with salicylic acid.

Mitscherlich's reaction for phosphorus depends upon the luminosity of phosphorus vapor when phosphorus is distilled in the dark with a current of steam.

Mohr's reaction for free acids, especially for HCl (in the gastric juice) is a mixture of 20 ccs. of a 10 p. c. potassium sulphocyanate solution with 5 ccs. of a 5 p. c. solution of ferric acetate. Hydrochloric acid with this reagent produces a cherry-red color with a brownish tinge; more of the acid causes a chestnut-brown coloration. This test also goes by the name of *Rheoch's* test.

Mohr's test for glucose. See *Moore's* test.

Molisch's reaction for carbohydrates. Shake ½—1 cc. of the solution to be tested with 2 drops of a 15—20 p. c. alcoholic solution of α-naphthol or thymol. Upon the addition of a like volume of concentrated sulphuric acid, the solution is colored violet (furfurol reaction) in the presence of carbohydrates (and several other substances). Upon the addition of water, a bluish-violet precipitate is produced, which is soluble to a yellow solution in alcohol, ether or potash lye.

Moore's test for glucose and sugar in the urine. Upon heating glucose solutions or diabetic urine with caustic potash, a brown coloration results; after acidifying with some acid, the odor of caramel appears. This test is also known as *Mohr's* or *Pelouze's* test. Compare also *Heller's* test.

Mueller's test for cystin. Upon dissolving cystin (prepared from the sediment of urine) in caustic potash, diluting this solution with water, and adding sodium nitroferricyanide, a purple-violet color is produced.

Mueller's solution for hardening microscopic preparations is a solution of 20 g. potassium bichromate and 10 g. sodium sulphate in 1 liter of water.

Mulder's test for glucose. Upon heating diabetic urine or any solution of glucose with a solution of indigo in sulphuric acid, and then carefully neutralizing with sodium carbonate, the color changes into green, then red and finally yellow, due to reduction of the indigo. Upon exposure to the air, the blue color is restored.

According to *Vogl's* modification, litmus is used instead of indigo; *Neumann-Wender's* test (q. v.) employs methylene blue.

Mulder's xanthoprotein reaction. Upon heating any albuminous substance with concentrated nitric acid, it is partially or completely dissolved to a yellow solution. In the case of albumoses and peptones this color is produced even in the cold. Upon supersaturating with ammonia or with fixed alkalies the color changes to orange-yellow.

Musculus' reagent for urea (ferment-paper). Decomposing urine is filtered, the filter washed, colored with curcuma, and preserved as test-paper. When added to solutions of urea, the attached ferment causes a splitting up of the urea, and the resulting ammonium carbonate causes the curcuma coloring matter to turn brown.

Neelsen's carbolfuchsin for identifying tubercle bacilli in the sputum is prepared by adding a concentrated alcoholic fuchsin solution to a 5 p. c. aqueous solution of carbolic acid (5 g. of crystallized carbolic acid are dissolved in 100 cc. of water and 1 g. fuchsin, dissolved in 10 g. alcohol, is added). *Erlich's* and *Ziel's* carbolfuchsin solutions have similar compositions.

Nessler's reagent for aldehyde. Aldehydes when treated with *Nessler's* ammonia reagent (q. s.) or with a solution of potassium mercuric iodide and baryta water, yield brownish-black precipitates, which differ from the precipitates caused by the same reagents in ammonia solutions, by being insoluble in potassium cyanide.

Nessler's reagent for ammonium salts is an alkaline solution of mercuric chloride and potassium iodide. With ammonia as well as with ammonium salts it causes a yellow to reddish-brown coloration or precipitate. The reagent is prepared according to various formulae, of which the following are typical:

I. 50 g. potassium iodide are dissolved in 50 cc. hot water and concentrated mercuric chloride solution (20—25 g. mercuric chloride) added until a permanent precipitate appears. After filtering, 150 g. potassium hydroxide dissolved in 300 ccs. water are added, and the whole diluted to one liter. 5 cc. more of the mercuric chloride solution is now added, the resulting precipitate allowed to settle, and the clear liquid decanted (*Kubel*).

II. Dissolve 2 g. potassium iodide in 5 g. water; add 4 g. of mercuric chloride, or enough so that upon warming a little of the precipitate remains undissolved. After cooling, dilute with 20 g. water, filter, and add 30 ccs. of a solution of 1 p. KOH in 2 p. of water. (*Ludwig*, Medicin. Chemie.)

Nessler's reagent for wine pigments is a solution of 7 p. alum and 10 p. sodium acetate in 100 p. water.

Neubauer's test for biliary acids is a modification of *Pettenkofer's* reaction. A few drops of urine are evaporated to dryness on the water-bath, a drop of sugar solution (1:500) and a drop of concentrated sulphuric acid are added, and the whole heated on the water-bath. If biliary acids are present, a violet-red color appears at the edge.

Neubauer's test for chloroform in the urine. A current of air is passed first through the urine in question, then through a red-hot porcelain tube, and finally through a solution of silver nitrate. If chloroform was present in the urine, a precipitate of silver chloride is formed.

Neumann-Wender's alkaloid reagent is furfurol-sulphuric acid (5 drops of furfurol in 10 ccs. pure concentrated sulphuric acid). See *Weppen's* veratrin reaction.

Neumann-Wender's test for grape sugar in the urine. 1 cc. of diluted urine (1 p. urine to 10 p. water) is treated with 1 cc. each of methylene blue solution (1:1000) and normal KOH solution and boiled for a minute. If the solution is hereby completely decolorized, sugar was present in the urine. Compare *Mulder's* test.

Nickel's test for mineral acids in the presence of organic acids depends upon the fact that only the presence of the former is wood stained by phloroglucin. If 0.5 p. c. of hydrochloric acid is present in vinegar, upon adding phloroglucin and a piece of pine wood or wood-pulp paper, this latter is distinctly stained upon boiling the solution.

Nickel's color reactions of carbon compounds. Compare Zeitsch. f. analy. Chem. 1889, p. 244; also see under *Millon's* reagent.

Nivière and **Hubert's** test for fluorine in wine. Render the wine slightly alkaline with ammonium carbonate and, by means of calcium chloride, precipitate any fluorides present as calcium fluoride. After heating the incinerated residues with silicic and sulphuric acids, fluorine is identified in the usual manner as silicium fluoride.

Noll's reagent is a solution of sodium hypochlorite.

Nylander's reagent for glucose. 2 g. bismuth subnitrate and 4 g. Rochelle salts are dissolved in 100 g. of an 8 p. c. solution of caustic soda. To 10 p. of the solution to be tested (diabetic urine) add 1 p. of reagent, and boil. A darkening of the liquid due to reduction of the bismuth salt indicates glucose. This solution is also known as *Almén's* solution.

Obermeier's reaction for indican. The urine is treated with lead acetate, the resulting precipitate filtered out, and the clear filtrate shaken with a ½ p. c. solution of ferric chloride in fuming hydrochloric acid (sp. gr. 1.19). Upon extracting with chloroform, this is colored blue if indican was present.

Olivier's test papers for identifying albumen and sugar in the urine, are filter papers saturated with well-known reagents for albumen and sugar.

Test-papers for albumen: picric and citric acids; sodium tungstate and citric acid; potassium mercuric iodide and citric acid; papers separately saturated with potassium ferrocyanide and citric acid.

Test-papers for sugar: indigo-carmine and sodium carbonate, separate.

These papers also go by the name of *Geissler's* test-papers. For particulars see Ph. Centralh., 24, p. 431; 25, p. 3.

Ost's copper solution for estimating sugar, contains 23.5 g. cryst. cupric sulphate, 250.0 g. sodium carbonate, and 100.0 g. potassium bicarbonate per litre.

Compare *Soldaini's* solution.

Otto's reaction for picrotoxin. The yellow solution of the alkaloid in concentrated sulphuric acid shows a reddish-brown color at the zone of contact with a drop of potassium bichromate solution; upon mixing, the solution is colored green.

Otto's morphine reaction. With a solution of hydrochloric acid, ferric chloride, and potassium ferricyanide, morphine solutions yield precipitates of Prussian blue.

Otto's modification of *Fehling's* solution (q. v.) is a solution of 1 p. copper sulphate and 3 p. tartaric acid, to which enough caustic soda solution is added to just produce a clear solution.

Pacini's solutions, Nos. I and II, are preservative solutions for microscopic sections, and have the following composition:

I.		II.	
Mercuric chloride,	1 p.	Mercuric chloride,	1 p.
Sodium chloride,	2 p.	Acetic acid,	2 p.
Glycerin (25° Bé),	13 p.	Glycerin (25° Bé),	43 p.
Water,	113 p.	Water,	275 p.

Pagel's test for phosphorous acid in phosphoric acid. Phosphorous acid, upon warming with mercuric chloride solution, gives a white precipitate of mercurous chloride.

Panum's test for albumen. Any liquid (as urine) containing albumen, yields a coagulum when boiled with a like volume of a saturated solution of sodium sulphate or sodium chloride.

Paul's reaction for biliary coloring matter. If normal urine (or urine containing sugar or albumen) is colored with methylviolet, the color remains unchanged; if, however, the urine contains biliary pigments, the violet color is changed to blood-red.

Papassyli's reaction for cane sugar. See *Reich's* reaction.

Pavi's solution for estimating glucose. 4.158 g. crystallized copper sulphate, 20.4 g. Rochelle salts, and 20.4 g. caustic potash are dissolved in water; 300 ccs. ammonia water (sp. gr. 0.88) are added, and the whole diluted to one litre. 10.0 ccs. of this solution represent 0.005 g. glucose. When all the cupric salt has been reduced to cuprous, the solution is colorless.

Compare *Fehling's* solution.

Pellagri's morphine reaction. Dissolve morphine in concentrated hydrochloric acid, add a few drops of concentrated sulphuric acid, and heat on the water-bath. A distinct purple coloration results. Now add some more hydrochloric acid, then sodium bicarbonate to a neutral reaction, and finally an alcoholic solution of iodine; the liquid is colored a deep chrome-green.

Pellet's solution for estimating glucose. 68.7 g. copper sulphate, 200 g. sodium chloride, 100 g. anhydrous sodium carbonate, and 6.87 g. ammonium chloride are dissolved in hot water and diluted with water to 1 litre. 10 ccs. of this solution are reduced by 0.05 g. glucose.

Compare *Fehling's* solution.

Pelouze's test. Same as *Moore's* test.

Penzoldt's test for acetone in the urine. A few crystals of ortho-nitrobenzaldehyde are dissolved in water and added to the distillate from urine, which is then rendered alkaline with caustic soda. In the presence of acetone the mixture becomes yellow, then green, and after several minutes indigo separates out.

Penzoldt's test for sugar in the urine, by means of *Ehrlich's* reagent. The urine is rendered strongly alkaline, and treated with a solution of diazobenzolsulphonic acid (1:60); at the same time a control test is made using normal urine. The latter is colored yellowish-red by the reagent; diabetic urine soon becomes dark red and opaque.

Penzoldt's test for naphthalene in urine. If 1 cc. of concentrated sulphuric acid is added to a trace of urine containing naphthalene; the urine floating on top of the acid will be colored dark green. Upon standing, the acid will assume the same color.

Perenyi's solution for hardening microscopic preparations consists of 4 volumes of 10 p. c. nitric acid, 3 vol. of alcohol, and 3 vol. of a 0.5 p. c. solution of chromic acid.

Perrot's reagent for ethereal oils is a solution of dimethylanilinviolet in glacial acetic acid and dilute alcohol. With many ethers, aldehydes, phenols, etc., this reagent gives characteristic colorations, but does not react with fatty oils or hydrocarbons. On this account this reagent can be employed to detect many adulterations of ethereal oils.

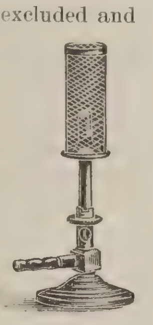
(To be continued.)

MONTHLY REVIEW.

Pharmaceutical Technique.

Protector for Bunsen Burner.

The organic chemist frequently has occasion to dissolve small quantities of substance in ether, alcohol, benzene etc. On account of the inflammability of these solvents heating with the direct flame is excluded and the waterbath has to be resorted to with loss of time. In order to make possible the direct application of heat with safety the following cap has been constructed.



Similar to Davy's safety lamp a cylinder of fine gauze is made and held together by means of a metal ring. The lower end of this cylinder is closed by a metal floor which is bent trumpet-shaped like the mouth piece of the blowpipes. It is furnished with several slits so that it will fit burners with tubes of different diameters. The upper end of the cylinder is covered with a round piece of the same gauze.

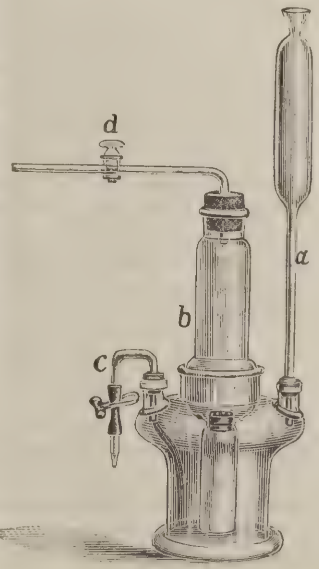
With the aid of this protective cap it is possible to heat ethereal or alcoholic liquids directly without danger of ignition. This apparatus as well as the gas generator described below are made by Max Kaehler & Martini of Berlin.

Barge's Apparatus for the Development of Gases.

It is generally known that many apparatus for the generation of gases are unsatisfactory because after they have been in use a short time the acid becomes saturated with the lye resulting from the reaction. The reagents are, therefore, not utilized to the best advantage.

In the new gas generator according to Barge this evil is avoided. The material, e. g. calcium carbonate and hydrochloric acid are completely consumed without a contamination of the unconsumed acid by the resulting calcium chloride solution.

The apparatus, illustrated by the accompanying cut, consists of a thrice tubulated supply flask. Into the large middle tubule there fits a large glass-ground cylinder *b* which extends nearly to the bottom of the supply flask. This cylinder is charged with the material, $CaCO_3$, FeS, Zn etc., necessary for the generation of the desired gas. This material is supported at a height of the middle tubule by a rubber stopper with severral perforations, which is fastened in an opening, about 3—4 mm. in diameter, of the large cylinder.



One of the side tubules supports a pressure tube with bulb and funnel. Into the other is inserted a bent tube *c* which acts as a siphon, one arm of which reaches to the bottom of the reservoir whereas to the other arm is attached a piece of rubber tubing closed by means of a pinch-cock. The mouth of cylinder *b* is provided with a perforated rubber stopper into which is inserted a glass tube with stopcock. The generation of the gas is regulated by opening and closing this stopcock.

In order to place the apparatus in working order cylinder *b* is filled with the necessary material, the cock inserted and the stopcock opened. Acid is then poured into *a* until it covers the opening in cylinder *b* thereby starting the generation of gas. The stopcock is closed and more acid added until about one-fourth of the cylindrical part of *a* is filled.

Gas, e. g. CO_2, can be had by simply opening stopcock *d*. The calcium chloride, resulting from the action of hydrochloric acid on calcium carbonate, being specifically heavy sinks to the bottom of the reservoir. Fresh acid enters from above through the small opening without coming in contact with the reserve acid. In this way all of the acid can be utilized. If in the course of time the apparatus has been filled with lye it can be drawn off through *c*. In an experiment, in which the apparatus was charged with marble and hydrochloric acid, 74 p. c. of the acid had been utilized. The apparatus is easily charged and cleaned and in its parts can easily be transported.

Chemistry.

Guaiac Resin.

O. Doebner has made a series of interesting reports under the following headings:

1. Ueber das Guajakharz, with E. Liecker;
2. Versuche zur Synthese der Säuren des Guajakharzes;
3. Ueber das Guajakblau.

The interested reader will have to be referred to the original, since these papers are not readily abstracted.
[Arch. d. Pharm. 234, p. 590.]

On the chemistry of Dammar Resin.

Tschirch defines dammar as a resin derived from species of *Dipterocarpeæ*, *Coniferæ* and *Burseraceæ*, principally from the species of *Hopea*, *Vatica* and *Dammara*.

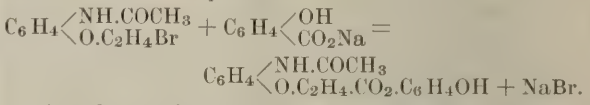
The article examined by Glimman in Tschirch's laboratory was a commercial variety from Batavia and is supposed to be derived from a member of the Nat. Ord. *Dipterocarpeae*. It yielded dammarolic acid, $C_{54}H_{77}O_3(OH)(COOH)_2$; an α-dammar-resene, soluble in alcohol; and β-dammar-resene, insoluble in alcohol, but soluble in chloroform. [Arch. d. Pharm., 234, p. 585.]

A New Class of Derivatives of Albumens.

F. Blum has observed than when a few drops of formol are added to a clear, filtered solution of egg-albumen, the latter looses its property to coagulate when heated. If such a solution is evaporated, an albumen results which is readily soluble in water and is precipitated unchanged from its aqueous solution by alcohol and acetone, i. e, it retains its solubility. Serum albumen behaves like egg-albumen. The author believes that these substances constitute a new class of albumens resulting from the addition of a methylene group to the albumen molecule. He suggests the name protogen for these compounds.
[Ber. 29, Ref., p. 914; from Z. physiol. Chem. 22, p. 127.]

Oxyphenacetine salicylate.

According to the patented process of Meister Lucius & Bruening of Hoechst a. M. this compound is prepared by the action of sodium salicylate or its substitute on bromphenacetine:



$$\mathrm{C_6H_4}\begin{matrix}\diagup \mathrm{NH.COCH_3}\\ \diagdown \mathrm{O.C_2H_4Br}\end{matrix} + \mathrm{C_6H_4}\begin{matrix}\diagup \mathrm{OH}\\ \diagdown \mathrm{CO_2Na}\end{matrix} = \mathrm{C_6H_4}\begin{matrix}\diagup \mathrm{NH.COCH_3}\\ \diagdown \mathrm{O.C_2H_4.CO_2.C_6H_4OH}\end{matrix} + \mathrm{NaBr}.$$

Oxyphenacetine salicylate crystallizes from alcohol in laminae of a satiny lustre melting at 132—134°. It is to be used medicinally. It is claimed that the disturbing therapeutic effects of its components, salicylic acid and oxyphenacetine, are not shown.
[Ber. 29, Ref., p. 933.]

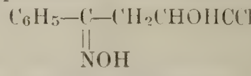
Condensation Products of Tannins and Formic Aldehyde.

The condensation product of tannic acid with formic aldehyde has been introduced as a remedy by E. Merck of Darmstadt. The same firm has prepared condensation products of formic aldehyde with the tannins of the following drugs: myrobalanen, quebracho wood, rhatany, oakbark, hemlockbark, walnutbark and catechu. The condensation products are prepared by dissolving the respective tannins in water and adding a slight excess of formic aldehyde solution and the requisite amount of hydrochloric acid or some other condensing agent. The resulting precipitate is filtered, washed and dried at medium temperature. In place of the isolated tannins the purified extracts of the drugs can be used. [Ber. 29, Ref. p. 932.]

Chloral-Acetophenonoxime.

This new remedy, $\genfrac{}{}{0pt}{}{\mathrm{C_6H_5}}{\mathrm{CH_3}}\!>\!\mathrm{C{=}NO.CHOHCCl_3}$, patented by A. C. Jensen, is said to be devoid of the detrimental effects of chloral hydrate and acetophenone, and can therefore be used as a specific against convulsions, such as epilepsy, eclempsia, and tetanus.

The compound is best obtained by bringing together molecular quantities of chloral and acetophenonoxime in benzene and at a low temperature. It crystallizes in hard, colorless prisms, melting at 81°. It is readily soluble in alcohol and ether, more sparingly in benzene and petroleum ether. Acids and alkalies split it into its components. The isomeric oxime,



$$\mathrm{C_6H_5{-}}\underset{\underset{\mathrm{NOH}}{\|}}{\mathrm{C}}\mathrm{{-}CH_2CHOHCCl_3},$$

described by Koenigs and Wagstaffe, resp. Wislicenus, is said to have entirely different physiological properties. [Pharm. Centrh. 37, p. 816.]

A New Method for the Volumetric Estimation of Iodine in Iodides.

E. Riegler proposes the following method: The iodine is eliberated by means of iodic acid and removed with the aid of petroleum ether. The excess of iodic acid is then estimated with $\frac{N}{10}$ sodium thiosulphate solution.

Iodic acid eliberates the iodine according to the following equation:—$6HIO_3 + 5NaI = 5NaIO_3 + 3H_2O + 6I$. $\frac{N}{10}$ iodic acid solution (17.6 g. in 1 l.) having been used the excess is titrated with $\frac{N}{10}$ thiosulphate solution standardized according to the following equation: $6Na_2S_2O_3 + 6HIO_3 = 3Na_2S_4O_6 + 5NaIO_3 + NaI + 3H_2O$. 17 g. iodic acid correspond to 24.8 g. thiosulphate. Starch solution serves as indicator. The solution of the iodide should not be of more than one percent strength. The liberation of the iodine is effected in a separating funnel and the mixture shaken twice with petroleum ether. The iodic acid solution is prepared by dissolving 17.6 g. of pure, crystallized iodic acid dried over sulphuric acid in sufficient water to make a liter. The solution can be kept for considerable length of time without change and the results are exact.

[Ber. 29, Rep., p. 918; from Zeitsch. f. anal. Chem. 35, p. 305.]

Erythrophlein.

This substance is of special interest because it exerts the so-called "digitalin" action on the living organism. It derives its name from its supposed source, the west African tree, *Erithrophleum guineense*, Nat. Ord. *Leguminosæ*, the wood of which is said not to be affected by the termites. The bark is known in German as *Sassi Rinde* or *Toli;* in English as casca or cassa bark; in French as *ecorce de Mançoire des Portugais* or *Bouvane de Floups*, and is used by the natives as arrow poison or as ordeal.

The alkaloid has been examined by several investigators, among them by Harnach about fifteen years ago. He now examined another sample of the hydrochloride supplied by E. Merck. This differed to no slight extent from the first alkaloid.

1. The salt as well as the platinum double salt constitute a fine, light yellow, amorphous powder.

2. The substance produced in cold- as well as warm-blooded animals the digitalin action only, not the picrotoxin action.

3. It was not hydrolized as readily as the former substance.

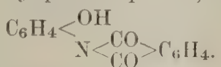
These differences are possibly due to the fact that the new material was derived from a different source. Gallois and Hardy (1876) already called attention to the fact that *E. Coumenga* contains a base which is closely related to that derived from *E. guineense.*

[Arch. d. Pharm. 234, p. 561.]

Derivatives of p-Amidophenols.

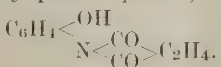
The importance of p-amidophenol as mother substance for numerous antifebric and antineuralgic substances has been emphasized by Prof. Mering. At the instigation of Prof. Doebner, Victor Wirths has introduced the radicles of dibasic acids into p-amidophenol, p anisidine and p-phenetidine. The substances obtained can but be enumerated here. For details the reader will have to consult the original.

A. 1) Phthalyl-p-amidophenol,



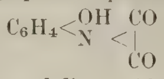
$$C_6H_4{<}\begin{matrix}OH\\ N{<}\begin{matrix}CO\\CO\end{matrix}{>}C_6H_4.\end{matrix}$$

2) Succinyl-p-amidophenol,



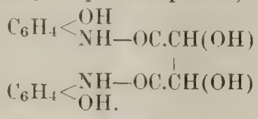
$$C_6H_4{<}\begin{matrix}OH\\ N{<}\begin{matrix}CO\\CO\end{matrix}{>}C_2H_4.\end{matrix}$$

3) Oxalyl-p-amidophenol,



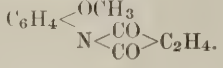
$$C_6H_4{<}\begin{matrix}OH\\ N{<}\end{matrix}\begin{matrix}CO\\|\\CO\end{matrix}$$

4) Tartronyl-di-p-amidophenol,



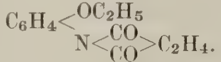
$$\begin{matrix}C_6H_4{<}\begin{matrix}OH\\ NH{-}OC.CH(OH)\end{matrix}\\ \quad\quad\quad\quad |\\ C_6H_4{<}\begin{matrix}NH{-}OC.CH(OH)\\ OH.\end{matrix}\end{matrix}$$

5) Succinyl-p-anisidine,



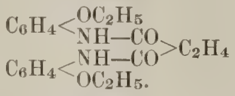
$$C_6H_4{<}\begin{matrix}OCH_3\\ N{<}\begin{matrix}CO\\CO\end{matrix}{>}C_2H_4.\end{matrix}$$

6) Succinyl-p-phenetidine,



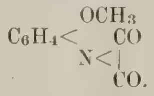
$$C_6H_4{<}\begin{matrix}OC_2H_5\\ N{<}\begin{matrix}CO\\CO\end{matrix}{>}C_2H_4.\end{matrix}$$

7) Succinyl-di-p-phenetidine,



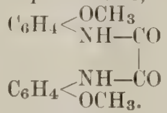
$$\begin{matrix}C_6H_4{<}\begin{matrix}OC_2H_5\\ NH{-}CO\end{matrix}\\ C_6H_4{<}\begin{matrix}NH{-}CO\\ OC_2H_5.\end{matrix}\end{matrix}{>}C_2H_4$$

8) Oxalyl-p-anisidine,



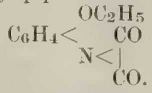
$$C_6H_4{<}\begin{matrix}OCH_3\\ N{<}\begin{matrix}CO\\|\\CO.\end{matrix}\end{matrix}$$

9) Oxal-di-p-anisidine,



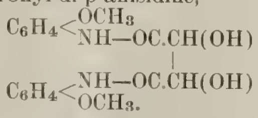
$$\begin{matrix}C_6H_4{<}\begin{matrix}OCH_3\\ NH{-}CO\end{matrix}\\ \quad\quad\quad\quad |\\ C_6H_4{<}\begin{matrix}NH{-}CO\\ OCH_3.\end{matrix}\end{matrix}$$

10) Oxalyl-p-phenetidine,



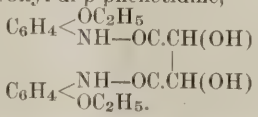
$$C_6H_4{<}\begin{matrix}OC_2H_5\\ N{<}\begin{matrix}CO\\|\\CO.\end{matrix}\end{matrix}$$

11) Tartronyl-di-p-anisidine,



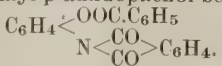
$$\begin{matrix}C_6H_4{<}\begin{matrix}OCH_3\\ NH{-}OC.CH(OH)\end{matrix}\\ \quad\quad\quad\quad |\\ C_6H_4{<}\begin{matrix}NH{-}OC.CH(OH)\\ OCH_3.\end{matrix}\end{matrix}$$

12) Tartronyl-di-p-phenetidine,



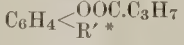
$$\begin{matrix}C_6H_4{<}\begin{matrix}OC_2H_5\\ NH{-}OC.CH(OH)\end{matrix}\\ \quad\quad\quad\quad |\\ C_6H_4{<}\begin{matrix}NH{-}OC.CH(OH)\\ OC_2H_5.\end{matrix}\end{matrix}$$

B. 1) Phthalyl-p-amidophenol-benzoate,



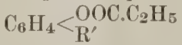
$$C_6H_4{<}\begin{matrix}OOC.C_6H_5\\ N{<}\begin{matrix}CO\\CO\end{matrix}{>}C_6H_4.\end{matrix}$$

2) Phthalyl-p-amidophenol-butyrate,



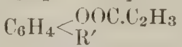
$$C_6H_4{<}\begin{matrix}OOC.C_3H_7\\ R'\,*\end{matrix}$$

3) Phthalyl-p-amidophenol-propionate,



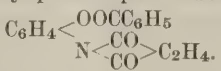
$$C_6H_4{<}\begin{matrix}OOC.C_2H_5\\ R'\end{matrix}$$

4) Phthalyl-p-amidophenol-acetate,



$$C_6H_4{<}\begin{matrix}OOC.C_2H_3\\ R'\end{matrix}$$

5) Succinyl-p-amidophenol-benzoate,



$$C_6H_4{<}\begin{matrix}OOCC_6H_5\\ N{<}\begin{matrix}CO\\CO\end{matrix}{>}C_2H_4.\end{matrix}$$

How many of these will serve their days as "new remedies" remains to be seen. Compare also the work by Wenghoeffer, vol. 14, p. 186.

[Arch. d. Pharm. 224, p· 620.]

[* $R' = -N{<}\begin{matrix}CO\\CO\end{matrix}{>}C_6H_4$.]

Practical Pharmacy.

A Paraffin-Naphthalene Emulsion.

One kg. of naphthalene is dissolved in 10 kg. hot paraffin oil and this solution is emulsified by thorough shaking with a solution of 33 kg. of soft soap in 33 kg. water at a temperature of about 85°. This emulsion can be diluted without the separation of paraffin oil. As an insecticide 15 kg. of this emulsion are diluted with 1000 l. water. Compare also vol. 14, p. 188.

[Ber. 29, Ref., p. 924.]

How to Keep Lemon Oil.

As is well known, lemon oil is one of the essential oils which readily deteriorate when improperly kept. Some time ago (Report, April 1895, pp. 35) we experimented with a view to ascertain the best mode of keeping lemon oil. Common, not dehydrated oil, as well as one deprived of water by treating it with anhydrous sodium sulfate, was kept in well closed vials, partly only half filled; part of the bottles were kept some time removed from light, and others some time exposed to light.

The result of these experiments was then recorded in the following words:

1. The dehydration of the oil by means of sodium sulfate is not only of no use, but rather detrimental to the oil.
2. The greatest possible exclusion of air from the vials is necessary for the unimpaired preservation of the oil.
3. The influence of light is injurious to lemon oil, but it is insignificant compared to that of air.

Lemon oil, therefore, should be kept in carefully closed vials, filled up to the neck and in dark and cool rooms. [Ber. Schimmel & Co., Oct. '96.]

Literary.

Books and Pamphlets Received.

Hermann Heyfelder — Berlin. Einführung in das Studium der Alkaloide mit besonderer Berücksichtigung der vegetabilischen Alkaloide und der Ptomaine. Von Dr. Icilio Guareschi. Mit Genehmigung des Verfassers in deutscher Bearbeitung herausgegeben von Dr. Hermann Kunz-Krause. Erste Hälfte, pp. VII, 304. 1896.

—— Tabellarische Uebersicht der im Handel befindlichen organischen Farbstoffe. Von Gustav Schultz und Paul Julius. Dritte vollständig umgearbeitete und stark vermehrte Auflage. Herausgegeben von Dr. Gustav Schultz. Ein Bd., pp. XVI, 216. 1897.

Felix Alcan — Paris. Dictionnaire de Physiologie par Charles Richet, Professeur de Physiologie à la Faculté de Médicine de Paris. Tome deuxième, 1er fascicule, pp. 1—320. Avec gravures dans le texte. 1896. Fr. 8.50.

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Reviews.

In Nacht und Eis. Die Norwegische Polarexpedition 1893 bis 1896. Von Fridtjof Nansen. Mit einem Beitrag von Capitän Otto Sverdrup. Deutsche Originalausgabe. Zwei Bände. Verlag von F. A. Brockhaus in Leipzig. 1896. $5.75. In 36 Lieferungen @ 16 Cents.

Die in der wissenschaftlichen und nautischen Welt zu grosser Berühmtheit gelangte dreijährige Nordpolreise des Norwegers Nansen hat auch in den gebildeten Kreisen aller Länder ein so grosses und allgemeines Interesse gefunden, wie keine andere der zahlreichen früheren Forschungsreisen in die Polarmeere. Gestützt auf die in denselben gewonnenen Erfahrungen, im Besitze gründlicher Sach- und nautischen Kenntnisse und eines guten praktischen Sinnes ist es Nansen gelungen, die früheren Schwierigkeiten und die Natur der grossen Strömungen der Polarmeere richtig zu erkennen und mittelst seines für die gewaltige Eispressung der langen Polarwinter rationell construirten Schiffes "Fram" dem Nordpole näher zu kommen, als das bisher gelungen war. Die von Nansen erkannten und der Geographischen Gesellschaft in London im Januar 1892 vorgetragenen Schlüsse über die Strömungen in den hohen Polarmeeren haben sich als zutreffend erwiesen und haben dem kühnen Forscher ein Vordringen bis kaum 50 Meilen zum Pole, ein dreimaliges Ueberwintern in der furchtbaren Eiseinöde und schliesslich eine Rückkehr des Schiffes zu den heimathlichen Gestaden ermöglicht.

Diese in der Polarforschung unerreichte Grossthat hat daher Nansen zu einem der gefeiertsten Reisenden und Forscher der Jetztzeit gemacht. Nach der ihm bei seiner Rückkehr im August d. J. in seiner Heimath dargebrachten glänzenden Begrüssung, entzieht sich Nansen vorerst allen weiteren Ovationen und Einladungen, um die Wissbegierde der Mitwelt durch eine eingehende Darstellung der Erlebnisse und Erfahrungen, sowie der wissenschaftlichen und praktischen Erlebnisse seiner dreijährigen Polarreise zu befriedigen.

Die erste Lieferung der deutschen Originalausgabe dieses mit höchster Spannung erwarteten Werkes ist soeben in dem rühmlich bekannten Verlage von F. A. Brockhaus in Leipzig erschienen. Bei dem allgemeinen Interesse für Nansen's Polarexpedition und für seine Beschreibung derselben dürfte diese erste Lieferung wohl in allen deutschen Buchhandlungen der Welt zur Zeit ausliegen und habhaft sein. Einer Beschreibung und besonderen Empfehlung bedarf das Werk nicht. Sind die Erwartungen an dasselbe wohl auch hochgehende, so dürfte es dieselben inhaltlich wie auch illustrativ mehr als erfüllen und auf seinem Gebiete eines der hervorragendsten Werke der neueren Litteratur werden. *Fr. H.*

The Development of the Periodic Law. By Dr. F. P. Venable, Professor in the University of North Carolina. One vol., pp. viii, 321. Chemical Publishing Co., Easton, Pa. 1896. $2.50.

Ever since man began to speculate about nature he has been tempted to refer to a prime matter or "Urstoff" the various manifestations of material nature that surround him. Water, air, and fire have been pronounced "Grundstoffe" by Thales, Anaximenes, and Heraclitus respectively during the sixth century B. C. The four elements of Aristotle or rather of Empidocles: fire, air, water, and earth were considered by the former not identical with the phenomenon, or the material objects known respectively by these names. To his mind they were but abstractions, abstract manifestations of the various combinations of the four prime qualities: warm, cold, dry, and moist of a prime matter or "Urstoff," of that which in itself is nothing yet has the capacity to be everything.

Geber's alchemistic theory of the metals involving the elements sulphur and mercury to which Basil Valentine in the 15th century added salt, in which modification it was adopted by Paracelsus and the iatrochemists was not different in essence from that of Aristotle. The difference consisted primarily in the names. This is clearly demonstrated by the otherwise remarkable fact that the two theories were held side by side by the same men for almost two thousand years.

With the discovery of a considerable number of elements during the last quarter of the last century and the first quarter of the present century this desire for a fundamental matter seems to have increased almost in a ratio with the discovery of new elements. Prout's hypothesis of 1816, that hydrogen might be considered as fundamental matter and that the other elements are but condensation products of hydrogen, attracted general attention and met with much favor, experimental facts to the contrary. A reaction from this wild dream, however, set in and when Newlands presented his system of octaves, he was ridiculed by his colleagues, and Mendelejef and Lothar Meyer shortly afterward received little or no attention. The fulfillment of a prophecy on the part of the Russian scientist accidentally emphacized the value of the periodic law and lent to it some credence in place of the skepticism that followed the failure of Prout's hypothesis.

It is of no little interest to note that at a time when other highly developed systems are being brought forth, the value of the periodic system, on which the newer ones are based, is being emphacized. The value of the periodic system as a didactic basis for the study of chemistry has put into the shadow the incidental role this system has placed in the prophecy and discovery of new elements. The periodic law: the properties of the elements are functions of their atomic weights, is the all important fact; the systematic pigeonholing of these elements is altogether of secondary importance.

A better service could not have been done the study of chemical philosophy than the production of a sketch of the development of this periodic law. Whether this law in its present form will stand or not is rather immaterial. What might be called the material development of chemistry has made its devotees only too content with the gathering of new facts and their arrangement into a system or systems. The by far weightier matter, the philosophic bearing of the results obtained has interested but few. It is to be hoped that the author's work may be crowned by assisting in the awakening of the interest in the historical and philosophic aspect of a science that is replete with interest along these lines of study.

E. K.

Lehrbuch der Oekologischen Pflanzengeographie. Eine Einführung in die Kenntniss der Pflanzenvereine von Dr. Eugenius Warming, Universitäts-Professor der Botanik und Direktor des Botanischen Gartens zu Kopenhagen. Deutsche, vom Verfasser genehmigte, durchgesehene und vermehrte Ausgabe von Dr. Emil Knoblauch, Privatdocenten der Botanik an der Universität zu Giessen. Berlin, Gebrüder Bornträger. 1896. M. 7.00.

The realm formerly assigned to plant physiology has with the development of the subject fallen into two more or less distinctly marked parts. Physiology concerns itself especially with the internal relations and processes. How the plant assimilates, how the water supply enters and is managed by the plant, how the organism responds to stimuli — these processes all present themselves as chemical or physical problems. In investigating these problems, the botanist seeks evidence that can be presented in exact units. The problems concerning the relations of plants to the outside world which present themselves more as objects for speculative consideration and yield only approximate results to experiment, fall within the field of ecological botany. As fair representatives of ecological problems there may be mentioned: the significance to the plant of the rain fall both with reference to its quantity and its frequency of appearance, the constitution and movement of the air in relation to plant life, the composition and physical characteristics of the soil as affecting the flora it supports, the relation of the change of seasons and of vertical elevation to the plant. Some German authors have included under the term "Biologie" (Weisner) an essentially similar range of subjects. The word "biology" as usually used by writers in the English language is given a much broader significance, anything pertaining to life being included (Huxley). Fortunately the word "ecology" is finding increased use in English, thus avoiding the possibility of confusion.

The book under discussion is a treatise on plant geography. The geographical distribution of plants has been treated by Grisebach, Meyen and Drude among others and always from the floristic standpoint. The objects sought have been to divide the earth's surface into natural floral areas marked by a similar floral population. Thus the distribution of any given species or group has been more or less thoroughly traced. Here systematic botany and geography have gone hand in hand. Thus far facts have been accumulated defining the parts of the world occupied by plants of various groups.

The questions arise, Why are certain species found where they are, what is the relation between the situation in question and the occurrence of the plant? To endeavor to account for the reason for this is the purpose of Warming's work. Here, plant ecology and geography work together. The author is a pioneer on this ground and his work, as he remarks, "has no prototype."

To give an adequate idea of the contents of this work here is out of the question. An introductory consideration of the ecological factors and their action on plants brings together with synoptic brevity a great amount of scattered information on the action of light, heat, moisture, precipitation, winds, the constitution of the soil and related subjects in their relation to plant life. The second section treats of living beings in their relation to the life of plants. The changes wrought by man, the part played by animals and by competing plants, by parasites of various degrees of independence are considered.

The classes of plant communities (Pflanzenvereine) follow. Plants are divided into four great primary groups according to their dependence on water and with reference to water as a substratum.

I. The *Hydrophyte* vegetation consists of plants surrounded by water or growing in a very wet soil, containing not less than 80 percent of water. II. The *Xerophyte* vegetation is at the other extreme and includes plants growing in a rocky soil or in a soil subjected to long periods of drought, water-content under 10 percent. III. The *Halophyte* vegetation is bound to a soil containing far beyond the usual amount of salts. IV. The *Mesophyte* vegetation is made up of plant communities adapted to a medium degree of moisture and the usual amount of salts in the soil. In each of the four classes occur five main types: thallophytes and mosses, herbs, dwarf bushes (*Calluna*, *Vaccinium*), shrubs and trees.

The various communities (Vereine) are then discussed with some detail. Peculiar structures aiding in adapting the plant to its surroundings, and anatomical changes wrought by external conditions find mention. There is thus accumulated in this work a wealth of scattered information of greatest service and interest to the student of outdoor botany. It is, indeed, difficult to speak in too high praise of this work.

A bibliography of about twelve pages appended to the work and cited frequently in the text adds to the value of the book. A very complete index makes ready reference possible. The mechanical part of the work is guaranteed by the name of the publishers.

This work, written originally in Danish and now translated by Dr. Knoblauch into German, should find its way into English since it would be of great value to students and others not conversant with either foreign language.

Rodney H. True.

Physikalisch-Chemische Propädeutik unter besonderer Berücksichtigung der medicinischen Wissenschaften und mit historischen und biographischen Angaben. Von Professor Dr. Med. und Phil. H. Griesbach. Erste Hälfte pp. 272, und zweite Hälfte, erste Lieferung, pp. 273—592, mit 104 Figuren. Verlag von Wilhelm Engelmann, Leipzig. 1895 und '96. M. 13.00.

The rapid growth of the various sciences has lead to an unprecedented degree of specialization in teaching as well as in investigation. The ground that was covered or mastered by a single person a century ago, to-day seems to call for a small army of specialists. Specialization on the whole, has been productive of so much good that we often fail to realize that it has any shortcomings. The mistakes that have been made by men who tried to cover too large a ground, have led us to go to specialists on almost all occasions. This has become true to a large extent even in the use of introductory text-books. To write a satisfactory text-book on physics, chemistry, and biology certainly is not every man's business. A book that combines the three in such a manner that the correlation of these fundamental sciences seems to open a new world to the student, certainly deserves our attention to the highest degree. If with this correlation the historic element is strongly emphacized, and the literary references are such that the student may be led to a more thorough and detailed study of the various chapters, the book accomplishes about all that can be expected from it.

The book does not presuppose any technical knowledge in any one of the three general sciences, but makes demands on a thorough general preparation such as is offered by the complete course of the German gymnasium. It is to assist the chemist, who should know of the biological application of his science to sanitary and hygienic as well as forensic problems without going into the study of medicine as such. It is also to emphacize to the medical student the importance of physico-chemical studies for a better understanding of medicine proper. Incidentally it also appeals to jurists who in their professional practice often are in need of the fundamental principles of the sciences in order to understand and appreciate the bearing of expert scientific testimony.

Inasmuch as a historical treatment assists in a better understanding, historical and biographical chapters are added. It certainly must be gratifying to all who look at the sciences from a broader than a matter of fact standpoint, that not only the history of the sciences is receiving more and more attention, but that history is introduced more and more into the study of a science.

On the whole the book appears to be on the height of modern science. The underlying principle of energy in the modern treatment of science is also made the backbone of this discourse. If the specialist can here and there find technical flaws, this cannot be surprising in a treatise outlined on so broad a foundation. As a propaedeutics, as an introduction into the study of the sciences this work is certainly admirable and deserving of close inspection on the part of teachers and of study on the part of those seeking such introduction.

E. K.

The Timber Pines of the southern United States. By Chas. Mohr, Ph. D., together with a discussion of the structure of their wood by Philabert Roth and an introduction by the Hon. B. E. Fernow, chief of the Division of Forestry Department of Agriculture. Bulletin 13, U. S. Dep't. of Agr. Dep't. of Forestry. One vol., pp. 160.

This is the first of a series of illustrated monographic works on the principal timber producing trees of the United States, and is devoted to the consideration of the group of pines found for the most part in the Gulf and south Atlantic coast states: Long Leaf pine, *Pinus palustris* Mill.; Cuban pine, *Pinus heterophylla* (Ell) Suclw.; Short Leaf pine, *Pinus echivata* Mill.; Loblolly pine, *Pinus Tæda* L.; Spruce pine, *Pinus glabra* Walt.

These extended investigations on the timber trees of the country are undertaken with the intention of furnishing data upon the rapidity of timber production throughout the life history of the tree, the time required for maturing a timber crop, the elements which are concerned in the make up of the quality of timber, the relation of soil and climate to timber growth and the commercial value of forest products, for the information and guidance of those who may desire to undertake forest management and cultivation for profit.

The chief interest of the chemist and pharmacist in this bulletin centres in an appendix to the work on the Long leaf pine, in which the naval store industry is briefly discussed. This industry is largely an American one and is one of the most important connected with the resources of American forests. A single item will serve to illustrate its importance. For the year 1892 the total production of spirits of turpentine alone amounted to more than 350,000 casks, requiring the orcharding of 2,500,000 acres of forest. Rosin, pine tar and pitch are other products obtained from the crude resin. The method of procuring the crude resin is described with illustrations of methods of orcharding, old and new, and the implements used.

The names of the veteran botanist Dr. Charles Mohr and the chief of the Division of Forestry, Hon. B. E. Fernow, are sufficient guarantee for the quality of their work. The anatomical work by Mr. Roth is excellent in every respect.

L. S. Cheney.

Repetitorium der Pharmacie für Anfänger und Vorgeschrittenere unter Berücksichtigung der Pharmacopœa Austriaca editio septima. Bearbeitet von Apotheker Carl R. Kreuz. Ein Bd., pp. 621. Druck und Verlag der Artist. Anstalt J. E. Kirchner's Witwe. Werschetz 1896.

This repertory, which has grown out of the author's earlier work, Pharmacognosie für den Erstunterricht, is to serve as a stepping stone to the commentary of the seventh edition of the Austrian pharmacopœia. It is divided into three parts, each part being supplied with one or more introductory chapters.

The first part comprises the pharmaceutical chemicals of the Austrian pharmacopœia, as well as unofficinal important ones, each being treated in the monograph style customary in such works. There is a general introduction, also chapters on analytical operations, utensils, reagents and volumetric solutions.

The pharmacognostical part contains a general introductory chapter, also chapters on the microscope, the elementary structure of the plant body, the most important plant constituents and their microscopic identification, and the preparation and application of the most important microscopic reagents. The drugs are treated in monograph style classified according to the natural orders to which they belong. Animal and mineral drugs receive mention in this part.

The third or pharmaceutical-technical part comprises what is better known in this country as operative and practical pharmacy. It includes chapters on apparatus and utensils used in a pharmaceutical laboratory, pharmaceutical operations and in the special part discusses the unofficinal galenicals, also in monograph style, the arrangement being an alphabetical one.

The appendix contains two tables: the first on the preservation of galenical preparations; the second on maximum doses for adults. The book also has a detailed table of contents and a complete index.

A book that is to serve at least in part for beginners should contain illustrations. These are altogether wanting. Even if it is to serve as a repertory for the somewhat advanced they would prove very useful. Of what use the short chapter on the microscope and the still shorter fragment on the balance are to be except for cramming purposes is difficult to understand. On the whole the style of treatment is empirical rather than scientific and reminds in this respect of not few of our American treatises on the same or kindred subjects. As long as the fate of a candidate depends so largely or almost exclusively on an examination such books will be written and be found useful. One probably cannot blame authors or publishers directly, but a system that calls for such productions is far from being perfect.

E. K.

Zur Kenntniss der Isomerieverhältnisse bei den ungesättigten Säuren. Habilitationsschrift von Dr. Wilhelm Autenrieth, I. Assistenten des chem. Universitäts-Laboratoriums der med. Fakultät zu Freiburg i. Br. Brochure, pp. 82. Akademische Verlagsbuchhandlung von J. C. B. Mohr, (Paul Siebeck), Freiburg i. B. und Leipzig. 1896. M. 2.00.

It is the custom at German universities that instructors who have been given the venia legendi, in others words have acquired the right to deliver university lectures, deliver a public lecture under the auspices, as it were, of the faculty, which they are about to enter. Such lectures frequently present a resumé along recent lines of investigation in which the newly elected docent has been especially interested.

Any person who has at all attempted to keep posted with the general trend of recent chemical research knows that a very large percentage of the hundreds of articles that fill every month the numerous chemical journals are fragmentary and therefore often bewildering rather than instructive and classifying. Yet these unfinished reports seem to be a matter of necessity in these days of specialization. A resumé of work along a certain line, being deprived of the host of bewildering details, is therefore welcomed by the chemical student.

The unsaturated organic acids constitute an exceedingly interesting chapter in chemical isomerism. Those who are interested in chemical isomerism in general or in that of the unsaturated acids in particular will no doubt find this inaugural dissertation very interesting reading. *E. K.*

Ausführliches Lehrbuch der Pharmaceutischen Chemie. Bearbeitet von Dr. Ernst Schmidt. Dritte vermehrte Auflage. Zweiter Bd., Organische Chemie, Dritte Abtheilung. Ein Bd., pp. 1081—1770, mit in den Text eingedruckten Holzstichen. Druck und Verlag von Friedrich Vieweg und Sohn, Braunschweig. 1896. M. 14.50.

The treatise on pharmaceutical chemistry by the Director of the Pharmaceutical-Chemical Institutes of the University of Marburg is so well and favorably known even on this side of the Atlantic that it is not in need of an introduction to the pharmaceutical reader of the Review. The earlier editions as well as volumes one and parts one and two of volume two have been reviewed in due time in this journal. The general comment made on previous occasions applies to the final part of the second volume. In it the chapter on volatile oils is concluded and followed by others on camphors, resins, tannins, etc. Considerable space is devoted to the alkaloids, which are discussed at length and in detail. This chapter is followed by one on glucosides and by another on vegetable and animal coloring matters. The last chapters are devoted principally to substances of interest in animal physiology, albuminoids, proteides, albuminoid ferments, toxalbumines, etc. With the present swinging of the pendulum back to animal therapy these chapters should prove of special interest.

Everyone, who is at all familiar with this standard work on pharmaceutical chemistry, will welcome the completion of the third edition. It is one of those works without which a pharmaceutical library can hardly be considered complete. A three-column index of fifty-eight pages adds materially to the use of the work for reference purposes. *E. K.*

Pharmaceutischer Kalender 1897. Mit Notizkalender zum täglichen Gebrauch nebst Hilfsmitteln für die pharmaceutische Praxis. Herausgegeben von Dr. H. Boettger und Dr. B. Fischer. Sechsundzwanzigster Jahrgang.

I. Theil. Kalendarium, Schreib- und Notizkalender, Hilfsmittel für die pharmaceutische Praxis. pp. 142.

II. Theil. Pharmaceutisches Jahrbuch. pp. 181.

Verlag von Julius Springer, Berlin. 1897. M. 3.00.

In the absence of an American pharmaceutical almanach this annual no doubt has and will continue to be of considerable service to German speaking pharmacists in this country. Though much of the information given applies more particularly to the German empire, there is much the value and importance of which is not restricted to any one country. This is especially true of the information contained in the first part. The pharmaceutical yearbook constituting part two, though of less practical importance to the average American pharmacist, nevertheless contains interesting information with regard to the general economic and legal status of German pharmacy. This is but little understood by most American pharmacists. The second part also contains an article on the central supply of water to municipalities, institutes, and single buildings by Dr. Fischer, who is director of the chemical experiment station of Breslau.

This almanach has grown out of the Pharmaceutischer Kalender für Norddeutschland, of which it constitutes the thirty-seventh volume. Part one is bound in cloth, part two in paper cover.

E. K.

Pharmaceutical Review.

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EDITORIAL.

A well-known German pharmaceutical manufacturer is quoted as having made the following statement with regard to the present pharmaceutical depression: "The tendencies of the times will not be checked either by the practicing pharmacist or by the manufacturer"; and furthermore "that the manufacturer does not seek his salvation in fruitless complaints, but in helping himself." This has stirred up many a conservative German pharmacist, who feels that the statement is not only unsympathetic but that the gentleman would not have made this remark if he did not feel that by his methods of advertising directly to the physician and public he had safely placed his nets and that the pharmacist was caught in its meshes. The dictum that "God helps those who help themselves," brought home so forcibly to the long-suffering pharmacists, has caused the discussion of the semi-socialistic idea of cooperation. It is suggested that each section of the German Apothecaries Society conduct its own manufacturing plant. The idea has probably been taken from this country. It will be of interest to learn what the German pharmacist, who ought to be in position to carry out the plan successfully if such is possible, will do with this suggestion.

The Supreme Court of Ohio has recently rendered a decision that reminds one strongly of Goethe's words: "Es erben sich Gesetz und Rechte gleich einer ewigen Krankheit fort." The court holds unanimously that the standard of purity of drugs called for by the Ohio law is that of the Pharmacopœia of 1880 which was in general use when the statute was enacted and that "the sale of a drug which was equal to the standard of strength, quality and purity laid down in that edition is not rendered unlawful because it is below a higher standard laid down in a subsequently revised edition, though that edition was in general use when the sale was made;" and finally that "a copy of the subsequent revised edition is not competent evidence in the trial of a prosecution under the statute."

The writer does not want to lay down the law for the Supreme Court of Ohio or for any Court, but simply desires to point out what this decision implies. Unless the laws of other states designate specifically that the standard shall be that of the latest edition of the pharmacopœia in force at the time the sale was made—which very likely is not the case—the courts of the various states, if they follow the precedent set by Ohio, will soon decide that we have about as many standards of purity for drugs as we have different bushels of various grains, a thought that ought to make the advocates of our antiquated system of weights very happy indeed. But how about the druggist? May he be prosecuted in Ohio if he makes his preparations according to the United States Pharmacopœia of 1890, if the standard of the seventh edition differs from that of the sixth in force in 1887 at the time when the statute was enacted in Ohio? How about the manufacturer? Will he have to manufacture preparations of one standard for Ohio, others of a different standard e. g. for New York or Michigan? Our legislatures as a rule were not short of lawyers. If the law is at fault and the court is all right, which presumably is the case, why does not the professional pride of the legal fraternity rise against the practices of their legislative colleagues rather than study the law years after it has been enacted in order to find some flaw. The fact simply is that lawyers are not so much seekers after truth as advocates. Incidentally this again emphasizes the necessity of a more careful study of our laws by competent persons and of an exposition for pharmaceutical students of law applied to pharmacy.

A recent number of the Pharmaceutical Era contains an article on Some interesting experiments with coated pills, by J. Fred. Windolph of Brooklyn.

The author shows that some pills examined possessed greater resistance than pine and demonstrates the fact to those who might be incredulous by a photograph of a pine board into which he has driven a number of pills, evidently with no serious result to the spherical character of the latter.

About six months previous the "Chemist and Druggist" called attention to a circular issued by the Danish Sanitary College to all pharmacists in Denmark, in which it is pointed out that the use of galenicals other than those made in the pharmacists' own laboratory is illegal. The comment is headed by the words "Setting back the clock of pharmacy" and the commentator sneers at the circular, "which enumerates various 'dangers' lurking in the new-fangled method of having one's pharmaceutical cookery done off the premises." If the Chemist and Druggists' collector of Foreign and Colonial News were treated to a dose of the above described pills he might be induced to give his colleagues across the North Sea such credit as they deserve.

Whereas it is deplored by some that the good old times have gone by when the pharmacist collected his own medicinal herbs, made all the galenicals prescribed by the pharmacopœia and even supplied the early laboratory student in chemistry with the necessary reagents; others have greeted the advent of elegant pharmacy made possible by the large pharmaceutical manufacturer as the dawn of a new era of our calling. A similar change has taken place in the arts. Home industry and the small shop have almost completely given way to the large manufacturing establishments. The concentration of small enterprises and the high degree of specialization of the artisan have revolutionized the mechanical industries. Perfection and finish of the highest order have been attained, the cost of production has been reduced and what was formerly impossible has become mere child's play as it were. Yet the blessing is not without alloy. The all round development of the artisan with his organized service as apprentice and assistant are things of the past. The social problems of the factory confront us and demand solution.

At the last meeting of the Wisconsin Pharmaceutical Association the writer called attention to the fact that in a certain city not a single specimen of bitter almond oil could be found, but that all the druggists who supposed themselves in possession of the article had paid a high price for impure benzaldehyde. The conclusion might be drawn that every pharmacist ought to distill his own bitter almond oil rather than pay a high price for a fraudulent article. Such indeed would imply a "setting back of the clock of pharmacy." There is no need whatever for such a procedure, for a scientifically educated pharmacist can ascertain more readily whether a bottle labeled bitter almond oil really contains such, than he can prepare it. There is no more reason why the pharmacist should attempt to do what the manufacturer can do better for him, than for a contractor to make himself the material with which he is to erect a given structure. The contractor, however, must test his building material before he puts it into a bridge, a building etc. If he did not he would be accused of criminal negligence. So the pharmacist. There exists, however, this difference. The engineer who builds a faulty bridge is soon found out. The guilty pharmacist may not be discovered even by the writer of the prescription.

As to galenicals, to which the Danish Board of Health alludes, one important factor must not be overlooked. It may be argued that the pharmacist who cannot or does not examine his bitter almond oil has no business to practice his chosen calling and should make room for the competent and honest. But how about galenicals? The pharmacopœias of the most highly civilized nations prescribe tests for but very few. Whereas they do not direct how chemicals are to be made, they direct how they are to be tested. Galenicals, as a rule, are directed to be made simply because our knowledge of them is so utterly insufficient that satisfactory tests cannot be provided. The person who ridicules the action of the Danish Board as setting back the clock of pharmacy evidently does not know what the word pharmacy implies. We shall all hail the day when galenicals can be tested with the accuracy with which chemicals can be tested to-day, but until then let us respect those who assume responsibility for the articles they dispense by making their galenicals from materials that can at least be identified.

The questions whether a better product can be turned out by the manufacturer on a large scale than by the practicing pharmacist on a small scale; whether the manufacturing pharmacist actually produces a better article than the druggist who is not trained to do the work; whether physician and public are warranted in having greater confidence in the manufacturer under conditions such as prevail in our country, are entirely distinct. Under the legal, educational and economical conditions existing in Denmark the Danish Sanitary College has certainly acted wisely by emphasizing that the pharmacist is responsible and that if he has no means of ascertaining by analysis the purity of an article he must himself make it from materials which he can test in accordance with the requirements of his pharmacopœia. Any setting back of the clock of pharmacy that results in the placing of responsibility where it belongs can have nothing but a wholesome effect.

The Apprenticeship-System in the Arts.

In an article on the apprenticeship-system[*] the writer several years ago traced the rise, prime and decline of this institution as applied to the arts in general, and demonstrated how the pharmaceutical apprenticeship grew naturally out of the general system at an early date and that there is no longer any reason for its continuance at the present time. In connection with a discussion on the education of the chemist, representing a profession so closely related to that of the pharmacist, the writer has more recently[†] availed himself of the opportunity to point out what the pharmacist must do if he desires to be recognized as a professional person.

The writer is fully aware that the arguments presented in the articles referred to appeal to a comparatively small number only, because a large percentage of druggists have no desire to be professional men, but business-men pure and simple. Some of these realize only the obstacles placed in their way by pharmaceutical legislation; and would prefer to have pharmacy, like any other business, open to unlimited competition common to all forms of business. Others would like to see their calling distinguished by a protective form of legislation enabling them to do business with the proverbial high percentage of gain reputed to the drug-trade.

It matters but little whether the druggist as a business-man belongs to the protected aristocratic or to the *laisser-faire* democratic class. In neither case will he be greatly affected by arguments of an educational character. Several years ago when the writer presented his views on the apprentice to a pharmaceutical audience, he was confronted by the query: "Where will we get our boys?" Inasmuch as this query voiced the sentiment of a large number of druggists, it clearly demonstrates that with many if not with most druggists the question is not one of principle, but one that is very largely influenced by the purse.

But if it were to be granted that the pursuit of the druggist is not to be that of a learned profession, but merely a trade, the responsibility and pride of keeping up or raising the standard of the calling will have to induce druggists' unions to take the very same step advocated, namely, the abolition of the system of taking apprentices.

In an article on "The decadence of the apprenticeship-system" the editor of the Scientific American, some time ago, after expressing his regrets over the degeneration of the system as a natural consequence of our modern industrial development, points to a solution of the difficulty by calling attention to the action of the National Association of Builders. Inasmuch as the opinion of a man, who cannot be considered an educational enthusiast, ought to have some weight with druggists, it may not be amiss to quote in part the editorial referred to.

> "It must be admitted, however, that excellent as were the results under the old apprentice system it would be impossible to carry it out under the present industrial conditions. The apprentice was 'bound' to his master, lived under his roof, and ate at his board. Modern social conditions and the modern temperament would not lend themselves to a compact in which the position of the boy was one of very pronounced servitude; and the keen competition in the various industries, the close margin upon which the master mechanic has to figure in competing for a share of the trade, the speed and thorough system which are necessary in a modern workshop, all render the careful training of green hands in the shops a practical impossibility. . . . . .
>
> "But if the old system, good as it was, is impracticable to-day, and the methods of to-day are so faulty, what, it will be asked, is to be the remedy? . . . .
>
> "The National Association of Builders has recommended that a lad who wished to enter a trade should go first to a trade school, and discover in which direction his tastes and aptitude lay. After passing an examination by a committee of master mechanics at the close of his course, he should enter the work-shop as a junior. Here he would acquire speed and execution, and by the time he was capable of doing a 'full day's work' he would be subjected to a second examination, the passing of which entitled him to be ranked as a journeyman."

E. K.

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[*] Pharm. Rundschau, 12, p. 229.
[†] Ibid. 14, p. 49.

Table of Specific Gravities for U. S. P. Preparations.

Calculated by *F. Dietze.*

	15°	10°	11°	12°	13°	14°	15°	16°	17°	18°	19°	20°	21°	22°	23°	24°	25°	26°	27°	28°	29°	30°
Acid. aceticum, 36 p. c...	1,048	1,050	1,050	1,049	1,049	1,048	1,048	1,047	1,047	1,046	1,046	1,045	1,045	1,044	1,044	1,043	1,043	1,042	1,041	1,041	1,040	1,040
Acid. aceticum glaciale...	1,058	1,063	1,062	1,061	1,060	1,059	1,058	1,057	1,056	1,055	1,054	1,053	1,052	1,051	1,050	1,050	1,049	1,048	1,047	1,046	1,045	1,044
Acid. hydrobrom. dilut...	1,077	1,079	1,078	1,078	1,078	1,077	1,077	1,077	1,076	1,076	1,076	1,075	1,075	1,075	1,074	1,074	1,073	1,073	1,073	1,072	1.072	1,072
Acid. hydrochloricum.....	1,163	1,166	1,165	1,165	1,164	1,164	1,163	1,163	1,162	1,162	1,161	1,161	1,160	1,160	1,159	1,159	1,158	1,157	1,157	1,156	1,156	1,155
Acid. hydrochlor. dilut...	1,050	1,051	1,051	1,051	1,050	1,050	1,050	1,050	1,050	1,049	1,049	1,049	1,049	1,048	1,048	1,048	1,048	1,047	1,047	1,047	1,047	1,046
Acid. lacticum................	1,213	1,216	1,216	1,215	1,214	1,214	1,213	1,213	1,212	1,211	1,211	1,210	1,210	1,209	1,208	1,208	1,207	1,206	1,206	1,205	1,204	1,204
Acid. nitricum dilut........	1,057	1,059	1,058	1,058	1,058	1,057	1,057	1,057	1,056	1,056	1,055	1,055	1,055	1,054	1,054	1,054	1,053	1,053	1,052	1,052	1,052	1,051
Acid. phosphoric. dilut...	1,057	1,058	1,058	1,058	1,058	1,057	1,057	1,057	1,057	1,056	1,056	1,056	1,056	1,056	1,055	1,055	1,055	1,055	1,054	1,054	1,054	1,054
Acid. sulphuricum...........	1,835	1,840	1,839	1,838	1,837	1,836	1,835	1,834	1,833	1,832	1,831	1,830	1,829	1,827	1,826	1,825	1,824	1,823	1,822	1,821	1,820	1,818
Acid. sulphuricum dilut..	1,070	1,072	1,072	1,071	1,071	1,070	1,070	1,070	1,069	1,069	1,068	1,068	1,067	1,067	1,066	1,066	1,065	1,065	1.065	1,064	1,064	1,063
Aether............................	0,725–0,728	0,730	0,729	0,729	0,728	0,727	0,726	0,725	0,724	0,723	0,722	0,721	0,720	0,719	0,718	0,717	0,715	0,714	0,713	0,712	0.711	0,710
Aether aceticus..............	0,893–0,895	0,898	0,898	0,897	0,896	0,895	0,894	0,893	0,892	0,892	0,891	0,890	0,889	0,888	0,888	0,887	0,886	0,885	0,884	0,884	0,883	0,882
Alcohol...........................	0,820	0,824	0,823	0,822	0,822	0,821	0,820	0,819	0,818	0,818	0,817	0,816	0,815	0,814	0,814	0,813	0,812	0,811	0,810	0,810	0,809	0,808
Alcohol absolutus..........	0,797	0,801	0,800	0,799	0,799	0,798	0,797	0,796	0,795	0,795	0,794	0,793	0,792	0,791	0,791	0,790	0,789	0,788	0,787	0,786	0,785	0,784
Alcohol dilutus..............	0,936	0,940	0,939	0,939	0,938	0,937	0,936	0,936	0,935	0,934	0,934	0,933	0,932	0,932	0,931	0,930	0,930	0,929	0,928	0,928	0,927	0,927
Amyl Nitris.....................	0,870–0,880	0,879	0,878	0,878	0,877	0,876	0,875	0,874	0,872	0,871	0,870	0,869	0,868	0,866	0,865	0,864	0,863	0,862	0,860	0,859	0.858	0,857
Aqua Ammoniæ.............	0,960	0,961	0,961	0,961	0,961	0,960	0,960	0,960	0,959	0,959	0,959	0,959	0,958	0,958	0,958	0,957	0,957	0,957	0,957	0,956	0,956	0,956
Balsam. Peruvianum......	1,135–1,140	1,140	1,140	1,139	1,138	1,137	1,137	1,136	1,135	1,134	1,133	1,133	1,132	1,131	1,130	1,129	1,128	1,128	1,127	1,126	1,125	1,124
Benzinum.......................	0,670–0,675	0,677	0,676	0,675	0,674	0,673	0,672	0,671	0,670	0,670	0,669	0,668	0,667	0,666	0,665	0,664	0,663	0,662	0,660	0,659	0,658	0,657
Carbonei Disulphidum....	1,268–1,269	1,275	1,274	1,273	1,272	1,270	1,269	1,267	1,266	1,265	1,264	1,262	1,261	1,260	1,259	1,258	1,256	1,255	1,254	1,253	1,251	1,250
Chloroformum................	1,490	1,498	1,496	1,495	1,493	1,492	1,490	1,488	1,486	1,485	1,483	1,481	1,479	1,478	1,476	1,474	1,473	1,471	1,469	1,467	1,465	1,463
Creosotum......................	1,070	1,075	1,074	1,073	1,072	1,071	1,070	1,069	1,068	1,067	1,067	1,066	1,065	1,064	1,063	1,062	1,061	1,060	1,060	1,059	1,058	1,057
Glycerinum....................	1,250	1,253	1,252	1,252	1,251	1,250	1,250	1,249	1,249	1,248	1,248	1,247	1,247	1,246	1,245	1,245	1,244	1,244	1,243	1,243	1,242	1,242
Liq. Ferri Acetatis.........	1,160	1,160	1,160	1,161	1,161	1,160	1,160	1,160	1,159	1,159	1,158	1,158	1,158	1,157	1,157	1,156	1,156	1,156	1,155	1,155	1,155	1,154
Liq. Ferri Chloridi..........	1,387	1,390	1,390	1,389	1,389	1,388	1,387	1,387	1,386	1,385	1,384	1,384	1,383	1,382	1,381	1,381	1,380	1,379	1,378	1,378	1,377	1,376
Liq. Ferri Tersulphatis..	1,320	1,323	1,323	1,322	1,321	1,321	1,320	1,320	1,319	1,318	1,318	1,317	1,317	1,316	1,315	1,315	1,314	1,314	1,313	1,312	1,312	1,311
Liq. Plumbi Subacetatis.	1,195	1,197	1,196	1,196	1.196	1,195	1,195	1,195	1,194	1,194	1,193	1,193	1,193	1,192	1,192	1,191	1,191	1,191	1,190	1,190	1,189	1,189
Liq. Potassæ..................	1,036	1,037	1,037	1,037	1,036	1,036	1,036	1,036	1,036	1,035	1,035	1,035	1,035	1,035	1,034	1,034	1,034	1,034	1,033	1,033	1,033	1,033
Liq. Sodæ......................	1,059	1,060	1,060	1,060	1,060	1,059	1,059	1,059	1,059	1,058	1,058	1,058	1,058	1,057	1,057	1,057	1,057	1,056	1,056	1,056	1,055	1,055
Ol. Amygdalar. express..	0,915–0,920	0,921	0,920	0,919	0,919	0,918	0,918	0,917	0,916	0,916	0,915	0,914	0,913	0,913	0,912	0,911	0,911	0,910	0,909	0,909	0,908	0,907
Ol. Anisi........................	0,980–0,990	—	—	—	—	solid	0,985	0,984	0,984	0,983	0,982	0,982	0,981	0,980	0,980	0,979	0,978	0,978	0,977	0,976	0,975	0,975
Ol. Cari.........................	0,910–0,920	0,919	0,918	0,917	0,917	0,916	0,915	0,915	0,914	0,913	0,913	0,912	0,911	0,911	0,910	0,909	0,909	0,908	0,907	0,907	0,906	0,905
Ol. Caryophylli..............	1,060–1,067	1,067	1,066	1,065	1,065	1.064	1,063	1,062	1,061	1,060	1,059	1,059	1,058	1,057	1,056	1,055	1,054	1,053	1,052	1,051	1,051	1,050
Ol. Cinnamomi...............	1,055–1,065	1,065	1,064	1,063	1,062	1,061	1,060	1,059	1,058	1,058	1,057	1,056	1,055	1,054	1,053	1,052	1,051	1,051	1,050	1,049	1,048	1,047
Ol. Foeniculi..................	0,960	0,963	0,962	0,962	0,961	0,960	0,960	0,959	0,958	0,958	0,957	0,956	0,956	0,955	0,954	0,953	0,953	0,952	0,951	0,950	0,950	0,949
Ol. Lini..........................	0,930–0,940	0,938	0,937	0,937	0,936	0,936	0,935	0,934	0,934	0,933	0,932	0,932	0,931	0.930	0,929	0,929	0,928	0,928	0,927	0,926	0,926	0,925
Ol. Menth. piperit.........	0,900–0,920	0,913	0,912	0,912	0,911	0,910	0,910	0,909	0,909	0,908	0,907	0,907	0,906	0,905	0,905	0,904	0,903	0,903	0,902	0,901	0,901	0.900
Ol. Olivæ.......................	0,915–0,918	solid	0,919	0,918	0,918	0,917	0,917	0,916	0,915	0,915	0,914	0,913	0,912	0,912	0,911	0,910	0,910	0,909	0,908	0,908	0,907	0,906
Ol. Ricini.......................	0,950–0,970	0,962	0,962	0,961	0,961	0,960	0,960	0,959	0,959	0,958	0,958	0,957	0,957	0,956	0,956	0,955	0,955	0,954	0,954	0,953	0,952	0,952
Ol. Sinapis volatile.........	1,018–1,029	1,027	1,026	1,025	1,025	1,024	1,023	1,022	1,021	1,021	1,020	1,019	1,018	1,017	1,016	1,015	1,015	1,014	1,013	1,012	1,011	1,010
Ol. Terebinthinæ............	0,855–0,870	0,865	0,865	0,864	0,863	0,862	0,862	0,861	0,860	0,860	0,859	0,858	0,857	0,857	0,856	0,855	0,854	0,854	0,853	0,852	0,851	0,851
Spirit. Aetheris nitrosi...	0,836–0,842	0,843	0,842	0,841	0,841	0,840	0,839	0,838	0,838	0,837	0,836	0,835	0,834	0,883	0,832	0,831	0,830	0,830	0,829	0,828	0,827	0,826
Syrupus.........................	1,317	1,320	1,319	1,319	1,318	1,318	1,317	1,317	1,316	1,315	1,315	1,314	1,314	1,313	1,313	1,312	1,312	1,311	1,311	1,310	1,309	1,309

Medicinal Plants of Brazil.*

By *Dr. Theodor Peckolt of Rio de Janeiro.*

Cryptocaria Mandioccana Meissn. Dieser circa 10 Meter hoher Baum kommt vor in den Staaten Espirito Santo und Rio de Janeiro und ist bekannt als *Cajaty*. Die aromatischen, ovalen Beeren von der Grösse einer Harzkirsche werden vom Volke nicht benutzt; nur die schwach aromatisch riechende, bitterschmeckende Rinde dient als Thee bei Magenbeschwerden, Kolik und Diarrhoe. Zu gleichem Zwecke dient die Rinde der in den Staaten Pará und Amazonas vorkommenden *Ajonea tenella* Nees. Das Bäumchen wird *Ajuba* und *Ai-uba* benannt. Das weisse, sehr feste Holz dient zu häuslichen Geräthschaften.

Cryptocaria densiflora Nees. Dieser dickstämmige, kleine Baum ist bekannt unter der Tugebenennung *Anhauiana* — hartes Holz. Das Holz dient zu Pfeilspitzen.

Ajonea brasiliensis Meissn. Ein stark stämmiger Baum welcher in allen Staaten von Bahia nördlich bis zum Aequator vorkommt und *Amajouva* benannt wird. Die Eingebornen benutzen die Blätter zur Heilung von Wunden. Das sehr dauerhafte feste Holz wird zu Bauten und Schiffen benutzt.

Silvia navalium Fr. Allem. Dieser Baum wächst auf den Gebirgen der Staaten Minas und Rio de Janeiro und heisst *Tapinhoam*, *Tapinhoâ* — Beulenbaum. Es ist ein kolossaler Urwaldbaum mit 16 bis 20 Meter hohem Stamm, welcher unten einen Umfang von 3 bis 6 Metern besitzt und mit einer dicken, korkartigen, an verschiedenen Stellen beulenartig aufgetriebenen, hell aschgrauen, doch nicht rissigen Rinde bedeckt ist. Die gekrümmten Aeste bilden eine dichte Krone, mit an den Spitzen der Zweige angehäuften Blättern. Diese sind lederartig, länglich schmal, stumpf oder spitz, oberseits dunkel-, unterseits hellgrün. Der Blüthenstand besteht aus verzweigten, lockeren Rispen, mit gelblichen Blüthen. Die Beere ist oval, 4 Cm. lang und besitzt einen Durchmesser von 18 bis 23 Mm. Der Baum blüht im December und reift seine Frucht im Juni. Das Holz ist zum Schiffsbau das gesuchteste. Zur Zeit der portugiesischen Besitzung wurde es als *Madeira de lei* bezeichnet. Der Eigenthümer konnte es zum eigenen Gebrauch benutzen, doch bei strenger Strafe nicht exportiren. Er durfte es nur an die Regierung verkaufen. Ausser der Dauerhaftigkeit hat es die vorzügliche Eigenschaft, dass es nicht von dem hier so häufigen und schädlichen Bohrkäfer (*Bostrichus*) beschädigt wird. Deshalb dient es ausser zum Schiffsbau auch vorzugsweise zu Tonnen und ähnlichem Fasswerk, zur Aufbewahrung und Versendung von Zucker, von Branntwein und Wein. Nach Faldauha hat es ein sp. Gew. von 0.741, nach Dr. del Vechio 0.997. Die Rinde wird als Adstringens benutzt, liefert auch eine grobe, doch sehr starke und dauerhafte Faser zur Anfertigung von Stricken.

Silvia Itauba Pax. Findet sich in den Nordstaaten und ist unter der Tupibenennung *Itauba*

Cryptocaria Mandioccana Meissn. This tree, reaching a height of about 10 meters, is found in the states Espirito Santo and Rio de Janeiro and is known as *Cajaty*. The aromatic, oval berries of the size of a Harz cherry are not used by the people; only the weakly aromatic, sickening, bitter-tasting bark is used, taken as a tea in stomach troubles, colic and diarrhœa. The same purpose is served by the bark of *Ajonea tenella* Nees., a tree occuring in the states Pará and Amazonas. This small tree is called *Ajuba* and *Ai-uba*. The white, very firm wood is used for domestic materials.

Cryptocaria densiflora Nees. This small, thick stemmed tree is known by the Tuge name *Anhauiana* — hard wood. It is used for arrowpoints.

Ajonea braziliensis Meissn. A thick stemmed tree which is found in all states from Bahia northward to the equator and is called *Amajouva*. The natives use the leaves to help the healing of wounds. The very durable, firm wood is used in buildings and ships.

Silvia navalium Fr. Allem. This tree grows in the mountainous regions of the states Minas and Rio de Janeiro, and is known as *Tapinhoam*, *Tapinhoâ*—"Beulenbaum." It is a giant of the primitive forests. The trunk varies from 16 to 20 meters in height and its lower circumference from 3 to 6 meters. It is covered with an ash-gray, thick, corky bark, which at various places has developed protuberances, but is not fissured. The crooked branches form a dense crown, the leaves being crowded at the ends of the twigs. The leaves are leathery, narrowly-oblong, blunt or acute; the upper surface is dark, the lower surface light green. The inflorescence consists of branched, loose panicles with yellow flowers. The berry is oval, 4 cm. long and has a diameter of 18 to 23 mm. The tree blossoms in December and the fruit ripens in June. The wood is sought more than any other for ship-building. During the time of the Portugese occupation it was designated *Madeira de lei.* The owner could use it for private consumption, but upon severe penalty was forbidden to export it. He was permitted to sell it only to the government. Besides its durability it possesses the excellent quality of not being attacked by the common borer (*Bostrichus*). For this reason it is also used in the manufacture of barrels and casks for the storage and transportation of sugar, brandy and wine. According to Faldauha it has a sp. gr. of 0.741, according to Dr. del Vechio of 0.997. The bark is used as an astringent. It also yields a fibre, which, though coarse, is strong and durable and is used for the manufacture of ropes.

Silvia Itauba Pax. This tree is found in the northern states and is known by the Tupi name

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* Continued from Vol. 14, p. 250. Translated for the Review by Dr. R. H. True, Asst. Prof. of Pharmacognosy at the University of Wisconsin.

— Steinholz bekannt. Es ist ein schöner, grosser, bis 20 Meter hoher Baum von ¾ Meter Durchmesser. Die Blüthen sind länglich-elliptisch, verkehrt eiförmig, stumpf, an der Basis spitz verlaufend. Der Blüthenstand besteht aus strauss-ähnlichen Rispen. Die Beere ist klein, länglich oval. Das mattgelbe Holz wird vorzugsweise zu Booten benutzt.

Die Varietät **amarella** Meissn., als *Itauba amarella* — gelbes Steinholz bekannt, unterscheidet sich durch länglich lancettliche, stumpfe Blätter. Die glänzend braunen, ovalen Blätter sind grösser. Das tiefgelb gefärbte Holz hat gleiche Benutzung und ist sehr gesucht zur Möbelfabrikation. Die Rinde dient ebenfalls als Adstringens. Ebenso sind als vorzügliches Bauholz geschätzt:

Acrodiclidium guyanense Nees. var. **caudatum** Meissn., *Itauba branoa*—weisses Steinholz, welches in den Staaten Para und Amazonas vorkommt. Das Holz ist weiss.

Acrodiclidium anacardioides Spruce, rothes Steinholz mit rothbräunlichem Holz. Diese gehörten sämmtlich zu den *Madeiras de lei.*

Acrodiclidium Camara Schomb. Dieser Baum ist im Staate Amazonas, besonders am Flusse Rio Negro, als *Itauba camara*, an der Grenze von Goyana als Càa-mara — Blattbaum bekannt. Es ist ein 10 bis 14 Meter hoher Baum mit dichtbelaubter Krone. Die Blätter sind lederartig, länglich elliptisch, spitz oder stumpf, oberseits glänzend grün, unterseits braun. Die Blüthen bestehen aus doldenartigen Rispen. Die Beeren sind länglich, ähnlich einer grossen Eichel, von dunkelgelber Farbe, bis zur Mitte von der Achse becherförmig umschlossen. Dieselben haben einen angenehmen, etwas Pichurim-ähnlichen Geruch und bitter aromatischen Geschmack. Dieselben werden gespalten, auf Fäden gereiht und getrocknet. Als Heilmittel sind sie geschätzt bei Krampf, Hysterie, fluor albus, Kolik, Ruhr etc. Das dauerhafte, bräunliche Holz dient zu Bauten.

Acrodiclidium chrysophyllum Meissn. Diese Art findet sich in den Staaten Maranhon, Para und Amazonas, wo dieselbe Sassafras benannt wird. Das nach hier importirte Holz ist bekannt als *Sassafraz do Para.* Es ist ein dünnstämmiger Baum, mit steiflederartigen, länglich elliptischen, zugespitzten Blättern, oberseits glänzend grün, unterseits goldgelb, seidenhaarig. Die Blüthenrispen sind straussartig und braun befilzt. Die Rinde besitzt einen aromatischen, Sassafras und Zimmetähnlichen Geruch sowie einen bitter gewürzhaften Geschmack. Als Thee dient dieselbe bei Verdauungsschwäche, als Carminativum und mildes Diureticum. Das angenehm riechende Holz wird in Form eines Decocts bei Rheumatismus angewandt: dreimal täglich eine Tasse. Die Sägespähne dienen zur Räucherung der Zimmer, als Desinfectans und auch zur Vertreibung der Mücken. Das Holz ist sehr gesucht zur Anfertigung von Toilettenmöbeln.

Aydendron permolle Nees. Dieser in den Nordstaaten, am häufigsten am Amazonenstrom vorkommende Baum heisst *Aü-üva* und *Ai-uba* — Faulthierbaum. Dieser riesige Urwaldbaum erreicht eine Höhe von 35 Metern. Die Blätter sind steif lederartig, länglich oval, zugespitzt, oberseits dunkelgrün, unterseits rostfarben und befilzt. Der Blüthenstand besteht aus gedrängt stehenden doldtraubenförmigen Rispen. Die Beere ist von der Grösse eines kleinen Apfels. Aus dem Samen wird

Itauba—stonewood. The tree is handsome and large, up to 20 meters in height, and has a diameter of ¾ meter. The flowers are oblong-elliptical, obovate, blunt, acute at the base. The inflorescence consists of bouquet-like panicles. The berry is small, oblong oval. The light yellow wood is used preferably for boats.

The variety **amarella** Meissn., known as *Itauba amarella*—yellow stonewood, is distinguished by its blunt, oblong-lanceolate leaves. The glossy brown, oval leaves are larger. The dark yellow colored wood is used for similar purposes and is sought very much for the manufacture of furniture. The bark also serves as astringent. Several other species are also highly esteemed as timber wood:

Acrodiclidium guyanense Nees. var. **caudatum** Meissn., *Itauba branoa*—white stonewood, which is found in the states of Para and Amazonas. Its wood is white.

Acrodiclidium anacardioides Spruce, red stonewood, with a reddish-brown wood. All of these belonged to the *Madeiras de lei.*

Acrodiclidium Camara Schomb. This tree is known in the state Amazonas, especially along the Rio Negro, as *Itauba camara*, on the border of Goyana as Càa-mara—leaftree. It is 10 to 14 meters high and has a densely foliaged crown. The leaves are leathery, oblong-elliptical, acute or obtuse, glossy green on the upper surface, brown on the lower surface. The inflorescence consists of umbel-like panicles. The berries are oblong, similar to a large acorn, of a dark yellow color and surrounded by a cup to the middle of its axis. They possess a pleasant, somewhat pichurim-like odor, and a bitter aromatic taste. They are split, strung on threads and dried. As medicament they are esteemed in convulsions, hysterics, fluor albus, colic, diarrhœa, etc. The durable wood serves for building purposes.

Acrodiclidium chrysophyllum Meissn. This species is found in the states Maranhon, Para, and Amazonas, where it is known as sassafras. The wood imported from those states is known as *Sassafraz do Para.* The tree has a thin trunk. The leaves are stiff, leathery, oblong-elliptical, acuminate, glossy green on the upper surface, golden yellow and silky on the lower surface. The floral panicles are bouquet-like, brownish-tomentose. The bark possesses an aromatic, sassafras- and cinnamon-like odor and a bitter, spicy taste. As tea it serves as remedy in dyspepsia, also as carminative and mild diuretic. The pleasantly odoriferous wood is used as decoction against rheumatism. Dose: a cup-full three times daily. The sawdust is employed for the fumigation of rooms, as disinfectant and against mosquitoes. The wood is sought for the manufacture of bed-room furniture.

Aydendron permolle Nees. This tree occurs in the northern states, principally along the Amazon, and is known as *Aü-üva* and *Ai-uba*—sloth tree. This giant forest-tree reaches a height of 35 meters. The leaves are stiff leathery, oblong-oval, acuminate, dark green on the upper surface, rusty red and tomentose on the lower surface. The inflorescence consists of crowded umbellate racemose panicles. The berry is of the size of a small apple. From the seed a starch is prepared,

ein Stärkemehl bereitet, welchem das darin enthaltene Harz einen aromatischen Geruch und Geschmack verleiht. Als Volksmittel dient es bei Verdauungsschwäche, bei Kolik der Kinder, Diarrhœ etc. Das weisse Holz dient zu Bauten.

Aydendron floribundum Meissn. Dieser Baum ist am häufigsten *Canella abacate*—Abacatezimmtbaum benannt; im Distrikt Cantazallo auch *Canella do brejo* — Sumpfzimmtbaum. Dieser im Staate Rio de Janeiro vorkommende Baum ist dünnstämmig und bis 12 Meter hoch. Die Blätter sind länglich lancettlich. Die gelben, wohlriechenden Blüthen sind in sehr kurz gestielten, reichblüthigen Rispen arrangirt. Die Beere ist von der Grösse und Form einer Abacatefrucht, deshalb die Benennung. Das Mesocarp ist fest parenchymatœs, das Endocarp knochenartig. Die Samen sind länglich oval, fünf Centimeter lang, stärkemehlhaltig und reifen im Juni. Der Geruch ist mild aromatisch, der Geschmack mild, bitter gewürzhaft. Das Stärkemehl wird wie bei der vorhergehenden Art benutzt. Die gepulverten Samen werden bei Leucorrhea benutzt, die Tinctur mit Wein als Tonicum. Das Mesocarp dient als energisches Adstringens, das Decoct der Blätter zu Waschungen unreiner Wunden. Das weisse Holz wird vorzugsweise zu Plafondbrettern benutzt.

which has an aromatic odor and taste due to the contamination with resin. As popular remedy it is used against dyspepsia, infantile colic, diarrhœa etc. The wood is used as timber.

Aydendron floribundum Meissn. This tree is commonly known as *Canella abacate* — abacate cinnamon tree; in the district of Cantazallo also as *Canella do brejo* — swamp cinnamon tree. It occurs in the state of Rio de Janeiro, has a thin stem and attains a height of 12 meters. The leaves are oblong-lanceolate. The yellow, odoriferous flowers are arranged in very short peduncled, many flowered panicles. The berry is of the size and form of an abacate, hence the name. The mesocarp is firm, parenchymatous, the endocarp bony. The seeds are oblong-oval, five centimeters long, contain starch and ripen in June. Their odor is mildly aromatic, the taste a mildly bitter aromatic. The starch is used like that of the above species. The powdered seeds are used in leucorrhœa, the tincture with wine as a tonic. The mesocarp serves as a powerful astringent, the decoction of the leaves for washing unclean wounds. The white wood is used preferably for ceilings.

(To be continued.)

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Assay of Johore Gambier.

By *W. O. Richtmann.*

Among the drugs purchased by the University of Wisconsin at the close of the Columbian Exposition there is a collection of Johore gambier, which was incorporated with the pharmaceutical cabinet. A chemical examination, particularly as to tannin and catechin content, was not only desirable in order to make these specimens more valuable for cabinet purposes, but was of interest also for the sake of comparison with gambier previously examined.

The moisture determinations were made by drying the comminuted gambier until of constant weight, in a waterbath drying oven. The ash determinations were made by incineration of the dried product. The tannin estimations were made according to a slightly modified process recommended in 1885 by the Commission of German technical chemists1). The catechin assay was made according to Trimble2) by extracting the aqueous solution with ether.

Cabinet specimen 2900 consisted of large irregular masses, was brittle and resembled in general appearance the ordinary lump catechin.

Specimen 2901 consisted of pieces which were fairly regular in shape, nearly rectangular in outline. The average dimensions were about 27x47x39 mm, the average weight 57.7 grams. The blocks were slightly gummy but did not resist comminution in a mortar.

Specimen 2902 consisted of dark brown cubes, the sides of which measured about 25 mm. The average weight was 6.06 grams. The article was easily pulverized.

Specimen 2904 consisted of smaller, light brown cubes, the sides of which measured about 11.5 mm. The average weight was 4.8 grams. The cubes were dry and readily pulverized.

Specimen 2905 resembled specimen 2902 very much, but was much lighter in color.

Specimen 2906 consisted of disc-shaped pieces about 7×55 mm. The average weight was 19.2 grams. The pieces were very gummy and covered with mould.

Specimen Number.	Moisture.	Ash.[5]	Tannin.	Catechin.
2900	12.37%	4.35%	39.63%	11.10%
2901	11.20%	3.63%	32.51%	9.22%
2902	1.38%	3.65%	40.51%	9.39%
2904	1.50%	1.87%	46.95%	5.25%
2905	8.37%	3.77%	22.21%	8.68%
2906	7.00%	4.13%	29.94%	6.98%

In some of the samples, especially numbers 2901 and 2900 small cavities were found which seemed to have been formed by fermentation. Small crystals, probably catchin, projected into the cavities. A biological examination according to the culture method was made. The absence of bacteria was demonstrated, but the presence of two fungi, *Penicillium glaucum* and *Aspergillus niger* was demonstrated. The biological examination was conducted under the direction of Mr. W. D. Frost, instructor in bacteriology. Specimens 2901 and 2905, which correspond as to general description with the specimens of Johore gambier examined by Macewan3) in 1885, agree also well as to tannin content. The highest percentage of tannin found in these Johore specimens also corresponds with the highest percentage of the same constituent found by Trimble4) in commercial gambier. It is

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1) See Trimble; The Tannins, p. 43.
2) Proc. A. Ph. A., 36, p. 100.
3) Am. Journ. Pharm., 57, p. 312.
4) Proc. A. Ph. A., 36, p. 101.
5) Calculated for inormal substance.

of interest to note that whereas no general rule can be laid down from the results so far recorded between the tannin and catechin content, that those specimens examined by Trimble and the writer which contained the highest percentage of tannin contained also the lowest percentage of catechin. It would be of no little interest to ascertain whether a direct relation exists between the two and whether the conversion of the one into the other is brought about or aided by vegetable organisms.

Pharm. Chem. Laboratory,
University of Wisconsin.

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Purification of Natural Cumarin.*

By *Edo Claassen.*

To purify the crude commercial cumarin, which is usually mixed with pieces of tonka beans, sand etc., the same may be dissolved in hot alcohol and the crystals obtained after cooling, redissolved and recrystallized until pure and white, or it may be treated in the following way: To the cumarin contained in a capacious copper distilling-vessel, a considerable quantity of benzin of a low specific gravity, for instance of 0.710 is added, the vessel connected with a condenser and the latter provided with a flask to receive the distillate, if any. The liquid is then heated to the boiling point and kept boiling for about 5 or 10 minutes, when any fire present is removed and the benzin solution poured into a well warmed bottle. When cold, the crystals, of a considerable size often, have appeared; they are collected on a filter and dried. The benzin is again poured on the crude cumarin and the same operation repeated as long as necessary to extract the cumarin from the crude article. While the first crystallizations are very white, the later ones are sometimes somewhat colored. From the benzin, used for the extraction and in which there is yet remaining a certain amount of cumarin, the latter can be separated by repeatedly shaking the same with a diluted sodium hydrate solution, for instance with one of 5%. The alkaline solution is then neutralized with hydrochloric acid, the precipitate collected after some time on a filter and dried.

When mixing the alkaline solution of cumarin with acid, the same turns turbid and milky; small globules of cumarin have appeared, which, however, after a short time change their shape, then representing needle-shaped crystals. To observe this very interesting transformation, the use of a microscope is highly recommendable.

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* Dr. Clemens Kleber calls attention to the fact that petroleum ether frequently contains impurities characterized by a persistent disagreeable odor. Wherever petroleum ether is used, care should be exercised in selecting a pure article or to purify the solvent. For this reason alcohol is as a rule preferably used for the recrystallization of odoriferous substances. It is conceded, however, that it is more difficult to obtain a perfectly white product when alcohol is used as solvent, especially when working with small quantities. The cumarin of commerce is to-day almost exclusively the artificial compound, which is cheaper and not likely to be mixed with fragments of tonka leaves etc. It might be well to add that a good Bohemian flask may be substituted with safety for the copper distilling-vessel suggested and that the use of an upright or reflux condenser may be used to advantage. Ed,

TRANSLATIONS.

Reagents and Reactions known by the Names of their Authors.*

Based on the original collection by *A. Schneider*, revised and enlarged by Dr. *Julius Altschul.*

Persoz's solution for distinguishing textile fibres is prepared by shaking a solution of 10 g. zinc chloride in 10 g. water, with 2 g. of zinc oxide. Upon digesting any fabric in this basic zinc chloride solution at 30°—40°, any silk contained therein is dissolved.

Pettenkofer's reaction for biliary acids. Upon adding cane sugar and concentrated sulphuric acid to a solution of biliary acids (in the urine), an intense purple coloration is produced.

Strassburg's modification. Dissolve some cane sugar in the urine, saturate filter paper with this solution, and after drying, bring the paper in contact with a drop of sulphuric acid. The red color is then to be observed in translucent light.

Drechsel's modification consists in the use of phosphoric acid (instead of sulphuric acid) and warming.

Udransky's modification. Instead of cane sugar and sulphuric acid, furfurol-sulphuric acid is employed.

See also *Neubauer's* test.

By reversing the process, *Pettenkofer's* reaction can also be employed in testing for sugar; e. g., in glucosides. See *Brunner's* reaction for digitalin.

Piria's tyrosin reaction. The sediment from the suspected urine is warmed with a little concentrated sulphuric acid, diluted, neutralized with calcium carbonate, and the filtrate treated with ferric chloride solution. If tyrosin was present, the solution is colored violet.

According to *Piria-Staedeler*, the urine sediment is warmed with a little concentrated sulphuric acid, the solution diluted, neutralized with barium carbonate, boiled, filtered, and added, drop by drop, to a dilute solution of ferric chloride.

Planta's alkaloid reagent. See *Mayer's* reagent.

Plugge's phenol reaction. A dilute phenol solution is rendered intensely red when boiled with mercuric nitrate solution containing a trace of nitrous acid. At the same time metallic mercury separates out, and an odor of salicylol is developed. Compare *Fresenius'* phenol reaction.

Plugge's reagent yields with albumen a red color similar to the one produced with *Millon's* reagent.

Plugge's reagent for gum ammoniac. 30 g. caustic soda are dissolved in water, the solution kept cool during the addition of 20 g. bromine, and then diluted to one liter. A drop of this solution, when added to an aqueous or alcoholic solution of gum ammoniac prepared with the addition of dilute soda lye, immediately causes a rapidly disappearing, beautiful violet color.

Podwyssotzki's reaction for emetine. With a drop of a saturated solution of sodium phosphouranate, emetine yields a brown coloration which turns to blue upon the addition of a drop of hydrochloric acid.

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* Continued from Vol. 15, p. 13.

Pollaci's phenol reaction. Phenol turns brown upon treatment with chromic acid mixture.

Posner's reaction for peptone and albumins in urine. After rendering the urine alkaline, it is poured into a test-tube and a layer of very dilute, almost colorless copper sulphate solution carefully poured on. Peptone causes the formation of a violet zone even in the cold; albumin gives the same reaction upon warming.

Compare *Brücke's* and *Rose's* biuret reaction.

Poutet's reaction for fatty oils (elaidin reaction). Pour 10 g. of oil, 5 g. nitric acid (40—42° Bé), and 1 g. mercury into a test-tube, dissolve the mercury by shaking for three minutes, allow the mixture to stand 20 minutes, and again shake for a minute. Various fats show differences in color, and in the ease with which they solidify. Olive oil and peanut oil harden most rapidly.

According to other authorities, 50 ccs. of the oil are mixed with 12 g. mercury and 15 g. nitric acid (sp. gr. 1.35), by which treatment only olive oil and oil of almonds are solidified, all other oils remaining liquid.

Pradine's reagent for foreign coloring matters in wine is a saturated solution of ammonia gas in ether. Upon shaking this solution with wine, the foreign coloring matters are dissolved in the ether.

Preyer's test for carbon monoxide in the blood. 3—4 drops of the suspected blood are warmed for 5 minutes at 30° C. with 10 ccs. water and 5 ccs. potassium cyanide solution (1:2). While the spectrum of normal blood, when treated as above, looses the absorption line of oxy-hæmoglobin, and in its place shows a broad absorption band, the spectrum of carbon monoxide blood remains unchanged.

Payer's hydrocyanic acid reaction. The reagent employed is a very dilute alcoholic tincture of guaiac resin, containing a trace of copper sulphate solution. Upon approaching this mixture, contained in a porcelain capsule, with a glass rod moistened with hydrocyanic acid, blue lines are formed in the liquid; upon stirring, the whole solution turns blue. Compare *Schönbein* and *Pagenstecher's* reaction.

Prollius' solution for extracting cinchona bark (for the determination of alkaloids) is a mixture of 88 p. ether, 8 p. absolute alcohol, and 4 p. water of ammonia.

Purdy's solution for estimating glucose contains 4.15 g. copper sulphate, 10 g. mannite, 20.4 g. caustic potash, 300 ccs. ammonia water (sp. gr. 0.88), 50 g. glycerin, and enough water to make 1 liter. 25 ccs. of this solution are reduced by 0.015 g. grape sugar.

Compare *Fehling's* solution.

Puscher's test for alcohol in ethereal oils. Into the bottom of a test-tube introduce a few drops of the ethereal oil and dust the upper portion of the tube with powdered fuchsin, or introduce the latter by means of a swab of cotton. Upon boiling, the alcohol evaporates first and dissolves the fuchsin to a red solution.

Rafaële's modification of *Spiegler's* reagent, (q. v.)

Raspail's reaction for albumens. These are colored red by sugar and concentrated sulphuric acid.

Compare *Schultze's* furfurol reaction.

Reich's reaction for cane sugar. Solutions of cane sugar when treated with cobalt nitrate solution yield a violet coloration upon the addition of soda lye. According to *Dupont*, this reaction is not interfered with by glycerin, milk sugar, glucose, or invert sugar; however, dextrin and gums should be removed by precipitation with lead acetate or baryta water.

Reichardt's test for arsenic in the urine. 200 ccs. of urine are concentrated with about 2 g. of caustic soda, the residue dissolved in a little water, acidulated with hydrochloric acid, and then tested in a *Marsh's* apparatus.

Reichardt's reaction for nitric acid (brucine reaction). Upon treating a solution of brucine in concentrated sulphuric acid, with a few drops of a solution containing nitric acid, a rose-red to deep red coloration appears. This reaction takes place even in dilutions of 1:100,000.

Reichert-Meissl's number indicates the number of ccs. of deci-normal sodium or potassium hydroxide solution necessary to neutralize the volatile fatty acids obtained from 5 g. of a fat, when operating according to a definite special method. The *Reichert's* numbers formerly in vogue gave the figures for 2.5 g. of fat, and are therefore only half as large as the *Reichert-Meissl's* numbers.

Reichl's test for glycerin. Equal parts of glycerin, phenol and sulphuric acid are mixed and heated to 120°. After cooling, water is poured upon the brownish-yellow solid mass and ammonia added drop by drop, whereby the mass is dissolved to form a beautiful carmine-red solution.

Reichl-Mikosch's reagent for albumens consists of benzaldehyde and sulphuric acid containing ferric sulphate.

Reinsch's arsenic test. A solution of arsenous or arsenic acid in hydrochloric acid is reduced by metallic copper. A gray coating of copper arsenide is formed upon the metal. Antimony and mercury behave similarly; their absence must therefore be proved before the presence of arsenic can be decided upon. This test is also known as *Hager's* empirical arsenic test (kramato method).

Remak's solution for hardening microscopical preparations is a mixture of 50 ccs. aqueous copper sulphate solution (20 p. c.), 50 ccs. alcohol (25°), and 35 drops purified wood vinegar.

Renard's test for peanut-oil depends upon the isolation of arachic acid (melting point 74–75°) by means of the lead salt, which can be separated from lead oleate by extraction with ether. For particulars see Chem. Ztg., 1895, p. 451.

Reuter's test for *p*-amidophenetol in phenacetin. The phenacetin is melted with pure chloral hydrate; if a violet color appears, amidophenetol was present. (Even the purest commercial specimens show a slight rose tint.)

Reynold's test for acetone in the urine. The distillate from the urine is shaken with freshly precipitated mercuric oxide (from mercuric chloride and potassium hydroxide). If acetone was present, the filtrate will contain acetone-mercury in solution and will respond to the tests for mercury.

Rheoch's test for free mineral acids. See *Mohr's* test.

Richardson's reaction for *α*-naphthol. 0.04 g. of naphthol and 0.5 ccs. of normal sodium hydroxide solution are dissolved in 1—2 ccs. of water. Hereto is added a mixture of 0.05 g. sulphanilic acid dissolved in 5 ccs. normal sodium hydroxide solution, and 0.02 g. sodium nitrite dissolved in 5 ccs. normal sulphuric acid. α-naphthol under these conditions yields a dark blood-red color, which changes to brown upon the addition of dilute sulphuric acid; β-naphthol causes only a reddish-yellow color.

Richmont's test for nitric acid. Mix the solution to be tested with concentrated sulphuric acid, cool, and pour on top a layer of ferrous sulphate solution. A purple to brown color indicates nitric acid.

Also called *Desbassin's* reaction.

Riegler's reagent for albumens is asaprol (calcium naphtholsulphonate). Albumens, albumoses, peptone, and pepsin are precipitated by this reagent in acid solutions, but the precipitates formed with the latter three dissolve upon warming.

Rinnmann's zinc test. When zinc oxide after moistening with cobaltous nitrate solution is strongly heated on charcoal, a green color results.

Ripart's solution, a mounting-medium for microscopy, consists of 75 p. camphor water, 75 p. distilled water, 1 p. glacial acetic acid, 0.3 p. cupric acetate, 0.3 p. cupric chloride.

Ritsert's glycerin test. Upon heating 1 cc. glycerin to boiling with 1 cc. of ammonia water, and then adding 3 drops of a 5 p. c. silver nitrate solution, no change should occur in the liquid within 5 minutes.

This test was intended to show the presence of arsenous oxide, as well as of acroleïn and formic acid; recent work however seems to have proved the test fallacious.

Ritsert's reaction for phenacetine. 0.1 g. phenacetine is boiled for a minute with 1 cc. concentrated hydrochloric acid, then diluted with 10 ccs. of water, filtered after cooling, and the filtrate treated with 3 drops of 3 p. c. chromic acid solution, whereupon the liquid gradually assumes a ruby-red color.

Ritsert's sulphonal reaction. Upon heating sulphonal with gallic or pyrogallic acid, the odor of mercaptan appears.

Robert's test for albumen. Upon pouring the suspected urine in a layer upon a concentrated solution of sodium chloride in 5 p. c. hydrochloric acid, a white zone will appear if albumen is present.

Robinet's morphine reaction. A neutral solution of a morphine salt, when treated with a dilute solution of ferric chloride containing some oxychloride, assumes a rapidly disappearing, blue color.

Roch's test for albumen in the urine. A salicylsulfonic acid solution yields a precipitate with albumen.

Rose's biuret reaction for albumens. If a solution of an albumen is rendered alkaline with soda lye, and a dilute copper sulphate solution (17—18 g. crystallized cupric sulphate in 1 litre of water) added drop by drop with constant shaking, the solution assumes first a rose-red, then a violet, and finally a blue color, which latter appears of a decided reddish tint when compared with a normal alkaline copper solution.

Compare *Brücke's* biuret reaction and *Posner's* reaction.

Rosenbach's test for biliary coloring matter. Upon the careful addition of a few drops of 5 p. c. chromic acid solution, urine containing biliary pigments is said to turn green. Upon adding more of the test solution, a brown color appears.

See also *Rosenbach's* modification of *Gmelin's* test.

Rosenstiel's aniline reaction. See *Runge's* aniline reaction.

Rosin's test for coloring matter from the bile. Pour a few cubic centimeters of dilute iodine solution in a layer upon the suspected urine. In the presence of biliary pigments, a green ring forms.

Rossbach's test for poisons consists in testing the action of alkaloids upon infusoria. The intensity of the action depends upon the degree of dilution.

Roth's reagent for fatty oils. Sulphuric acid of sp. gr. 1.4, saturated with nitrous fumes and mixed with the oil to be tested, gives different results as regards color and solidification, depending upon the nature of the oil.

Compare *Poutet's* elaidin reagent.

Roussin's crystals. Nicotine in ethereal solution yields with an ethereal iodine solution an oily mass, from which ruby colored crystals, reflecting dark blue, gradually separate.

De la Royère's reaction for fatty oils. A few drops of the oil to be tested are treated with two drops of a fuchsin solution to which just enough alkali has been added to decolorize it. Fatty oils when so treated cause a red coloration, due to the free acids which they contain. According to *Halpher* this test has only a limited value, since mineral oils may also contain acids. On the other hand, the acids of the fats, e. g., in lubricators, might be neutralized by alkaline soaps. The presence of soaps, however, could be easily proved by a solution of Congo-red just colored violet by hydrochloric acid; such a solution turns red with soaps.

Rubner's reaction for glucose and milk sugar. The solution to be tested is treated with lead acetate and ammonia, and warmed. In the presence of the above named sugars, a red precipitate results.

Runge's aniline reactions.

a) Aniline solutions, in the absence of ammonium chloride, yield with chlorinated lime solutions a purple-red color, which changes to rose-red upon the addition of acids.

According to *Rosenstiel's* modification, in case the aniline is impure, ether is added after admixture of the chlorinated lime solution; this takes up the brown product formed, so that the aqueous solution remains of a pure blue color.

b) A pine shaving, moistened with a dilute solution of an aniline salt, is colored yellow.

Runge's reaction for cane sugar. Sugar is blackened upon concentrating it with dilute sulphuric acid. Of course, many other organic substances act likewise.

Sachsse's solution for determining grape-sugar contains 18 g. mercuric iodide, 25 g. potassium iodide and 80 g. potassium hydroxide per litre. The modified

Sacchse-Heinrich's solution contains only 10 g. potassium hydroxide for the above quantities. The grape-sugar solution (which should be about 5 p. c. strength) is added to the boiling reagent until all the mercury salt is reduced. As an indicator hydrogen sulphide is used, being added to a small portion of the solution after acidulating with acetic acid. 40 ccs. of the reagent are reduced by 0.1342 g. grape-sugar. (Concerning the reduction numbers of other sugars see Pharm. Centralh. 21, p. 211.)

Salkowsky's test for peptone in the urine. 50 ccs. of urine are acidulated with hydrochloric acid and phospho-uranic acid added. The precipitate formed is washed, warmed on the water-bath, dissolved with a little soda lye, and a few drops of 1—2 p. c. copper sulphate solution added. In the presence of peptone, a red color appears.

Salkowsky's test for carbon monoxide in the blood. Mix the suspected blood with 19 p. water and add an equal volume of soda lye (sp. gr. 1.34). If the blood contains carbon monoxide the mixture becomes turbid, at first whitish, then light red; after some time, red flakes separate out on the surface of the rose-colored liquid. Normal blood is colored a dirty brown by soda lye.

Salkowsky's cholestrin reaction. The substance to be tested, e. g., lanolin, is dissolved in chloroform and the solution shaken with concentrated sulphuric acid. In the presence of cholesterin, the chloroform becomes blood-red while the sulphuric acid assumes a greenish fluorescence. The reaction can also be applied as a zone-reaction, in which case the presence of cholesterin causes a brownish-red zone.

This reaction was first mentioned by *Hager*.

Salkowsky's phenol reaction. Phenol solutions are colored blue or greenish by the addition of ammonia and a few drops of chlorinated lime solution.

Salkowsky's reaction for creatinin. See *Weyl's* reaction.

Sandlund's test for iodine in the urine. 5ccs. of urine are treated with 1 cc. sulphuric acid (1:5) and 2—3 drops of sodium nitrite solution (1.0 g. in 500 ccs.), and shaken with carbon bisulphide. In the presence of iodine (up to 0·001%), the carbon bisulphide becomes colored.

Schaefer's quinine test (oxalate test). 1.0 g. crystallized or 0.85 g. anhydrous quinine sulphate are dissolved in 35 ccs. of boiling water, whereupon a solution of 0.3 g. crystallized neutral potassium oxalate in 5 ccs. of water are added, and the whole made up with distilled water to 41.3 g. The vessel is now placed for half an hour into a water-bath of 20° C., shaking occasionally, and finally filtered through glass-wool. If the quinine was free from allied alkaloid, no turbidity should be produced upon the addition of a drop of caustic soda solution to 10 ccs. of the filtrate.

Schaefer's test for cinchonidine in quinine sulphate (tetrasulphate test), depends upon the slight solubility of cinchonidine tetrasulphate in alcohol. 1 g. quinine sulphate is dissolved in 9 g. absolute alcohol and 3 g. 5% sulphuric acid. After allowing this solution to stand for a day with occasional shaking, any cinchonidine present will have separated out as tetrasulphate. Upon dissolving this precipitate in water and precipitating with caustic soda solution, pure cinchonidine of melting point 199° C. can be obtained.

Schaefer's reaction for identifying nitrites in the urine. 3—4 ccs. of urine are decolorized with animal charcoal, and then treated with an equal volume of diluted acetic acid (1:10) and 2 drops of 5% potassium ferrocyanide solution. The solution is colored yellow if nitrites were present.

Schaefer's test for naphthol-yellow in cakes, pastry, etc. 10—20 g. of the material to be tested are broken up into crumbs and warmed with 40 ccs. of alcohol (50—60% by vol.). Naphthol-yellow colors the alcohol yellow; upon addition of hydrochloric acid this color disappears, while that produced by saffron would remain.

Schaffgot's solution for precipitating magnesia without the addition of fixed alkalies consists of 235 g. ammonium carbonate and 180 ccs. ammonia water (sp. gr. 0.92), diluted to one litre.

Schaer's test for blood. See *Hühnefeld's* turpentine solution.

Scheele's reagent for arsenous acid in a solution of copper sulphate in an excess of ammonia water; this produces a light-green precipitate with arsenites.

Scheibler's reagent for alkaloids in phosphotungstic acid, which produces precipitates similar to those caused by phospho-molybdic acid. (*Sonnenschein's*, *Jungmann's*, *De Vry's* reagent). The reagent is prepared by dissolving 100 g. sodium tungstate and 60—80 g. sodium phosphate in 500 ccs. of water acidulated with nitric acid; or according to *Otto*, by simply adding phosphoric acid to a solution of sodium tungstate.

Schell's reagent for cocaine. Upon mixing cocaine hydrochlorate with calomel and moistening with a little water, (even breathing upon the powders is sufficient), the mixture will be blackened by partial reduction of the mercury salt. Compare *Lenz's* reaction for pilocarpine.

Scherer's test for inosite. Upon evaporating an aqueous solution of inosite almost to dryness with nitric acid, treating the residue with ammonia and a trace of calcium chloride, and again concentrating, a rose-red solution results.

Scherer's test for brucine. Upon carefully evaporating bencine to dryness on platinum foil with nitric acid, and warming the residue with caustic soda solution, a yellow liquid remains which upon further heating forms an oily drop.

Scherer's test for phosphine in the excreta in phosphorus poisoning depends upon *Hager's* test (g. v.) by means of silver nitrate paper.

Schiff's cholesterin reaction. If cholesterin is mixed with concentrated sulphuric acid and then ammonia water added, a red coloration appears.

Schiff's uric acid reaction. An alkaline uric acid solution reduces silver nitrate or silver carbonate. Moisten filter-paper with silver nitrate solution, touch the moistened spot with a little dilute solution of sodium carbonate, and dip the paper so prepared into the solution to be tested. A black spot will appear if uric acid was present.

Schiff's test for urea. If a solution of urea (urine) is treated with furfurol and hydrochloric acid, a violet color is produced; upon standing, an insoluble brown mass separates out.

Schiff's reagent for aldehydes is fuchsin-sulphurous acid. See *Guyon's* reagent.

Schlagdenhauffen's reagent for distinguishing alkaloids from glucosides is a mixture of equal parts of a 3% solution of guaiac resin and a saturated mercuric chloride solution. Only alkaloids give a precipitate with this reagent in the cold or at 60—79° C.

Schlickum's arsenic test. Upon pouring the suspected solution in a layer upon a solution of 0.02 g. sodium sulphite and 0.4 g. stannous chloride in 3—4 g. concentrated hydrochloric acid, a yellow zone appears if arsenic is present.

(To be continued.)

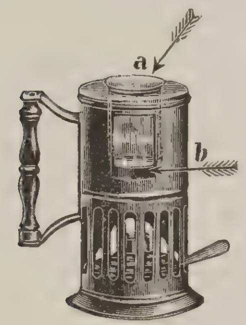
MONTHLY REVIEW.

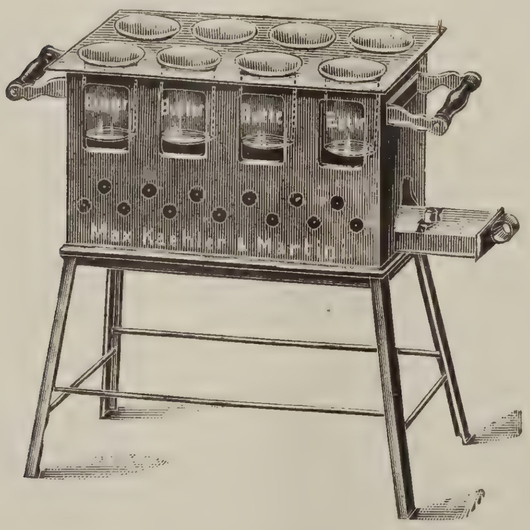
Pharmaceutical Technique.

A New Butter-tester.

The following, taken from the "Central-Blatt für Nahrungs- und Genussmittel-Chemie, sowie Hygiene" is a description of a very simple apparatus for testing butter for oleomargarine, constructed by Dr. B. Alexander-Katz of Görlitz, Ger.

The method of examination is based upon the observation that even slight additions of oleomargarine cause butter to become so apaque after twice melting, that a mark on the containing vessel cannot be distinguished through the molten fats. In the ordinary forms of apparatus used to test the purity of butter by melting, the layman finds difficulty in noticing the slight turbidity produced by small additions of oleomargerine. In Dr. Katz's tester the word "Butter" is burned into the glass with blue color. After melting the suspected butter twice, you observe through a slit whether the word "Butter" is distinctly visible in the light reflected from the shining metallic walls of the apparatus. With pure butter, even when old or rancid, the letters are usually distinctly legible, while this is not the case in the presence of but slight traces of oleomargerine.





The apparatus can be obtained from Max Kaehler & Martini, Berlin. The simplicity as well as the low cost of Katz's tester would recommend it especially for commercial purposes, where it is desired to identify the adulterated specimens of butter rapidly and without cost.

Chemistry.

Volumetric Determination of Acetone.

In the Moniteur Scientifique of 1893, 41, 4 Serie, Vol. 7, 1°, p. 272—274, MM. J. Robineau and G. Rollin publish a paper entitled "Dosage Volumetrique de L'Acetone." Dr. E. R. Squibb has recently reported on an improvement of the process whereby it is rendered easier, more simple, quicker, and better adapted to technical uses, whilst still sufficiently accurate for most purposes.

The solutions used by Dr. Squibb are the following:

1. A standard solution of acetone containing one-tenth gram of acetone in 10 ccm. of solution.

2. A liter of solution of potassium iodide containing 2.5 grams of the iodide in 10 ccm. of the solution.

3. Solution of sodium hydroxide: Of commercial caustic soda, purified by alcohol, 257 grams are dissolved in distilled water, the solution made up to one liter, and set aside until it settles quite clear. Then 850 cc. of clear solution are poured off and added to the solution of potassium iodide, making 1,850 cc. of total solution.

Of this solution 20 cc. are taken for each titration.

The remainder of the soda solution is again allowed to settle clear for farther use in the hypochlorite solution.

4. Solution of sodium hypochlorite. The officinal solution of chlorinated soda to a liter of which 25 ccm. of the above described clear soda solution are added.

If there be much of this titration to do it is very convenient to fit this bottle with an automatic zero burette, as shown in the accompanying illustration, this form being, so far as is known, original with the writer and very convenient for general rapid working with a burette. The advantage is, beside that of rapid and easy working, that it does not require a special burette and is easily fitted up from the resources of any laboratory.

5. Bicarbonated starch solution prepared as follows: Starch, 0.125 gram, is mixed with five cc. of cold water, and then added to twenty cc. of boiling water and boiled. When cold two grams of sodium acid carbonate are added and stirred until dissolved. Kept in a colorless bottle this solution does not sensibly diminish in delicacy or reaction in three months. But for how much longer it would remain good for this reaction was not tried.

The Titration. The burette being filled with the solution of sodium hypochlorite, ten cc. of the standard solution of acetone (equal to one-tenth gram of acetone) is measured into a beaker of about fifty cc. capacity, and twenty cc. of the mixed solution of iodide and soda are added and stirred well. Into this the hypochlorite solution is passed in rapid dropping, with constant stirring, until eight or ten cc. have been run in. Then the precipitated iodoform is allowed to settle out, and a drop or two more hypochlorite are added. Should this produce a dense cloudiness, one-half cc. more hypochlorite is added, and well stirred and again allowed to settle. Then a drop or two more of hypochlorite are added. If there should still be a cloudiness, another one-half cc. of the hypochlorite is added and well stirred, and so on until the cloudiness is very slight. Then the starch testing begins.

A small drop of the liquid is transferred by a rod to a white porcelain tile or plate, and a similar small drop of the starch solution is placed very near it. Then with the first rod the drops are made to connect by a fine line, so that the whole has a dumb-bell form. If there be no blue color, one or two-tenths cc. more of the hypochlorite is added and well stirred, and the testing is repeated until finally a blue line will be seen at the moment of contact of one drop with the other. If the last negative testing has taken 10.4 cc. from the burette, and this positive testing, which has given the blue line, required 10.6 cc., then the accepted reading would be 10.5 cc., and this would be the hypochlorite equivalent of one-tenth gram of acetone. If the blue line be very faint, it will be momentary only, and will indicate that the excess of hypochlorite is very small, and that 10.6 cc. is a closer reading than 10.5, but the process is not sufficiently accurate to take much account of such differences, since even with much experience and great care it is hardly practicable to get any two titrations to agree within one-tenth cc. of hypochlorite.

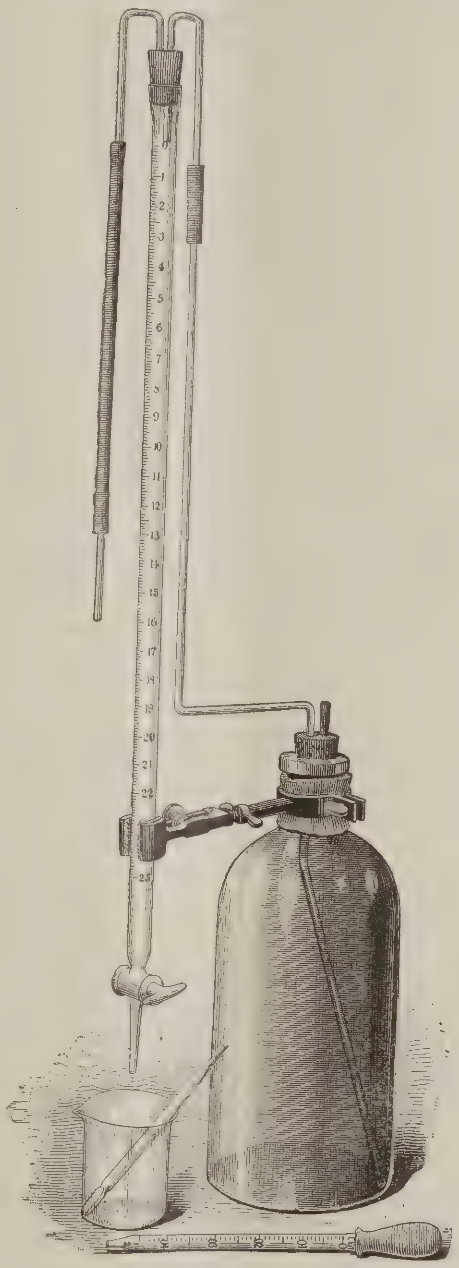
Having then 10.5 cc. as the hypochlorite equivalent of one-tenth gram of acetone at this time, it is easy to estimate any smaller or larger quantity of acetone that requires a smaller or larger quantity of the hypochlorite by the equation $10.5:0.1::a:x$.

But this hypochlorite solution is liable to diminish in strength by keeping, and therefore must be standardized by this standard acetone solution as often as the accuracy of the determinations may require. At times the change in strength is scarcely perceptible from day to day in several successive day's work, but in standing for a week or two there will always be a falling off in strength to the extent of one-tenth to five-tenths cc. in the hypochlorite. The addition of the soda solution appears to render the hypochlorite more permanent, just as the sodium bicarbonate renders the starch solution more permanent. But in the case of the starch the blue reaction does not occur if the bicarbonate be not present.

The titration of the acetone present in unknown dilutions requires first that the strenght should be estimated by known conditions or by sensible properties, in order to keep the proportions of the reagents and the dilutions approximately the same, or at least not differing very widely when close determinations are required. If then the taste and smell should indicate that the acetone to be tested is below twenty-five percent, four-tenths cc. may be taken for the testing. If over twenty-five percent and under fifty percent, two-tenths cc. may be taken. If over fifty percent, one-tenth cc. is sufficient.

For the adjustment of these small quantities with a sufficient degree of accuracy for rapid technical working, it is convenient to have a five-tenths cc. pipette divided in 0.01 cc. fitted with a rubber bulb, as shown in the illustration. By screwing the neck of this bulb up or down upon the glass, with the point in the liquid, close measurements may be quickly made.

A beaker of fifty cc. capacity containing ten cc. of water is weighed and the weight noted. The four-tenths, two-tenths, or one-tenth cc. of the sample to be titrated is delivered in the water and the weight again taken to give the quantity of the sample taken for the titration. Then the twenty cc. of the iodide and soda solution is added, the whole well stirred, and the hypochlorite dropped in, and the end reaction managed precisely as described in standardizing the hypochlorite, and the quantity of hypochlorite used is noted. Then as 10.5 cc. of the hypochlorite is used to one-tenth gram of acetone, so is the quantity of hypochlorite now used to the quantity of acetone present in the portion of the sample taken for titration. Then as the weight of this portion taken for titration is to the quantity of acetone found in it, so is 100 to the percentage of acetone in the sample.



For example, a sample supposed to be not far from absolute is to be titrated. A fifty cc. beaker with ten cc. of water weighs 25.283 grams; with one-tenth cc. of the sample added the weight becomes 25.360 grams, giving 0.077 gram as the weight taken for the titration. To this is added the twenty cc. of iodide and soda solution, and the mixture being well stirred, the hypochlorite is dropped in to saturation when seven and nine-tenths cc. is found to have been used. Then as 10.5 is to one tenth, so is seven and nine-tenths to 0.0752 gram of acetone in the 0.077 gram of the sample taken. Then as 0.077 gram of the sample taken is to the 0.0752 of acetone indicated, so is 100 to 97.66 percent of acetone in the sample.

This is the rationale of the operation, but the calculation is shortened by simply dividing the standard hypochlorite (10.5 cc.) into the hypochlorite required (seven and nine-tenths cc.) to get the corresponding acetone (0.0752 gram), and then dividing the weight of the sample taken (0.077 gram) into the weight of acetone obtained from it (0.752 gram) to get the percentage proportion of the acetone (97.66 percent.).

Of course the method of definite dilution, and the titration of an aliquot part, as described in the original paper of Robineau and Rollin (see translation) is available and more accurate than that here recommended, and takes but little more time.

Where acetone is made, or is much used, and especially in processes where it is recovered by distillation to be used over again, there is often much need of testing the strength of very weak dilutions, and of knowing when acetone is absent. In many such uses accuracy is not required and rough estimates are sufficient. For work of this kind, especially when the strength is below ten percent, the weighing of the sample to be tested may be omitted, because the specific gravity is so nearly that of water that the measure may be accepted as cubic centimeter for gram.

Determination of acetone in the presence of ethyl alcohol. The standard dilution of acetone containing ten grams in the liter was used, and ten cc. of this required 14.3 cc. of the hypochlorite solution. On repetition 14.4 cc. was required.

A dilution of ethyl alcohol was made containing ten grams in the liter, and ten cc. of this requires one-tenth cc. of the hypochlorite. On repetition 0.125 cc. was required.

To ten cc. of the acetone dilution two-tenths cc. of the alcohol dilution was added, and this mixture required 14.4 cc. of the hypochlorite solution. On repetition 14.4 cc. again was required.

To ten cc. of the alcohol dilution two-tenths cc. of the acetone dilution was added, and this mixture required 0.35 cc. of the hypochlorite. On repetition four-tenths cc. was required.

In each case ten cc. of the iodine and soda solution was used and all other conditions were kept fairly uniform.

In the case wherein the hypochlorite was added to alcohol alone no precipitate or cloudiness was visible, although 0.1 to 0.125 cc. was required to obtain the starch reaction. When acetone had been added to the alcohol one-half this quantity of the hypochlorite was sufficient to give decided cloudiness.

These results appear to confirm the conclusions of Robineau and Rollin to the effect that the presence of ethyl alcohol has no effect upon the titration of acetone by this method, although ethyl alcohol is an iodoform-yielding substance. The small quantity of hypochlorite required to obtain the starch reaction when alcohol alone was titrated was probably in consequence of traces of impurity in the alcohol.

[Journ. Am. Chem. Soc., No. 12, 1896].

Botany and Pharmacognosy.

Salvia officinalis.

Attention has recently been called to the therapeutic value of this once famous remedy. Krahn studied its therapeutic effect on 38 patients of the Greifswald clinics in cases of hyperhydrosis. Of the 38 only two were not effected. Of the 36, of whom 29 were phthisic patients, the profuse perspiration ceased or was diminished. It again set in upon non-administration. The tincture was employed in doses of about twenty drops three times daily.

[Therap. d. Geg. 37, p. 733; from
Centralbl. f. innere Med., 1896, 38.]

Adulteration of Cinnamon with Cane Sugar.

Dr. Rudolf Hefelmann finds cane sugar much used to adulterate powdered cinnamon. The sugar, he believes, is added in order to mask a considerable addition of sand. Since the sugar does not appear in the ash determinations, the full ash allowed can be made up by the addition of sand. The detection of cane sugar offers no difficulties since aqueous extracts of cinnamon specimens containing no sugar are never dextrogyrate, Ceylon cinnamon giving rather a slight turn to the left because of its greater content of invert sugar. For the details of the rather complicated process, the reader is referred to the original article.

[Pharm. Centralb. 17, p. 699.]

Amanita Poisoning.

In a recent paper on fungi, edible and poisonous, Charles M. Ilvaine discusses the genus *Amanita* of the *Agavicini* or gilled fungi.

The genus *Amanita* contains not over thirty species of which number eight are deadly to man, the remaining ones being either edible or not capable of producing death. Of the eight fatal species, a piece as large as a pea is sufficient to cause death. The symptoms of amanitine poisoning do not appear until eight or ten hours after eating, when a gray pallor, faint breath, thickened tongue and violent retching follow. The poisonous principle acts as a narcotic and affects the nerve centers, especially those controlling the heart. On the first symptoms, a hypodermic rejection of 1/90 grain of atropine is administered and continued until 1/20 grain has been given or the patient is cured. Emetics are worse than useless. No test or method of cooking either destroys or makes possible the detection of the toxic principle.

[Am. Journ. Pharm., 68, p. 651].

Indian Podophyllum.

Professor Wyndham R. Dunstan, Director of the Scientific and Technical Department of the Imperial Institute, in a preliminary note printed in the Institute journal, gives some results of the examination of the constituents of *Podophyllum emodi* commenced in the Research Laboratory of the Pharmaceutical Society by

Mr. T. A. Henry and now in progress. The podophyllin of the Indian root is much lighter than that made from *Podophyllum peltatum* owing to the larger quantity of podophyllotoxin which it contains (30 p.c.). The commercial American resin contains on an average about 20 p. c. The medicinal action of the Indian resin has been investigated by Dr. H. W. G. Mackenzie, of St. Thomas' Hospital, who finds that the two resins are identical in their medicinal effects, and that, therefore, there is no reason why the resin obtained from the Indian root should not be substituted for the American resin. *Podophyllum emodi* yielded from 9 to 12 p. c. of resin; *Podophyllum peltatum* gave from 4.2 to 5.5 p. c. Results thus far obtained indicate that podophyllotoxin can no longer be regarded as the chief active principle of the resin.

[Chemist and Druggist, 49, p. 827.]

Practical Pharmacy.

Citruria.

Under this name Radlauer's Kronen-Apotheke of Berlin brings into the market tablets which are said to consist of urea, citric acid, and lithium bromide.

[Pharm. Centrh. 37, p. 816.]

Aluminium oleinicum.

This is an ethereal solution of aluminium oleate. Upon the addition of an alum solution to a solution of an oil soap a sticky mass is precipitated, which is triturated with warm water and while still moist is dissolved in ether. It is intended to have this preparation take the place of traumaticin, a concentrated solution of gutta percha in chloroform.

[Pharm. Post, 29, p. 540.]

Concentrated Solution of Hydriodic Acid.

Sharp & Dohme of Baltimore, Md., have placed upon the market a 10% solution of hydriodic acid for the extenporaneous preparation of syrup of hydriodic acid of any strength. By using this preparation, the pharmacist is to avoid the loss and annoyance due to the deterioration of this syrup upon standing, either by the liberation of iodine or discoloration of caramel, caused by the action of the acid on the sugar. The manufacturers claim that their concentrated solution of hydriodic acid will keep indefinitely, even if exposed to the light and in partially filled bottles, but do not state what has been added to secure this stability.

Egg Emulsion of Cod Liver Oil.

It is a well known fact that most of the cod liver oil emulsions on the market contain less than 40% of acid, the remaining 60% or upward being made up of gum Arabic, Irish moss, and other emulsifying and flavoring agents, which not only add nothing to the therapeutic value of the emulsion, but retard its beneficial action by untoward effects on the digestive organs.

Egg emulsions have long been recognized as far superior to the class above referred to, but the lack of permanency has heretofore proven an apparently insuperable obstacle to their success.

Parke, Davis & Co. now announce that they have secured a stable formula (L. B. Hewitt's), which enables them to incorporate fully forty percent of cod liver oil with no other emulsifying agent than eggs, and no other flavoring than brandy. Their claims for the preparation are: perfect emulsification; remarkable nutritive properties; palatability; permanency under ordinary conditions of storage; miscibility with water, milk, wine, etc.; and standard strength of forty percent by volume.

New Remedies.

Just what constitutes a new remedy it is by no means easy to state. No doubt any or every definition that might be attempted would include the host of new organic chemicals that are annually thrust as it were upon the market by chemical manufacturers. In fact, a new vegetable or animal drug or even a new mineral water might legitimately be included under this title. The term, however, has been used in a broader sense. Vegetable drugs that have been obsolete for generations have been revived. They may have been in use as domestic remedies in some part of the world, but the discovery of some new therapeutic application makes them a "new remedy". An organic chemical may have served its purpose as reagent or solvent for years without having been found useful in medicine. The discovery of some peculiar physiological property, or the discovery of a means of application of a well-known physiological property at once stamps it as a "new remedy." Even urea, the first organic compound synthesized, is to-day a "new remedy" as *urea pura*. Vegetable drugs that have been used not only as household remedies, but have been employed for generations by the medical profession of one country, become "new remedies" to-day or to-morrow in some country in which they were known before principally as scientific curiosities.

This usage has led to the introduction of the term newer remedies. Whether the use, misuse or abuse of this term will ultimately lead to the introduction of the superlative of this attribute remains to be seen.

The importance of supplying information with regard to these "new" or "newer" remedies has been recognized by almost all pharmaceutical journals. The carelessness with which such journals frequently are compiled has lead to very unreliable and even ridiculous statements. Thus, e. g., a desinfectant prepared by the U. S. Army laboratory and by E. R. Squibb and used during the war in the early sixties was described (14, p. 107) under its historic name *chlorinium* as an interesting war relic now in possession of the historical cabinet of the University of Wisconsin. The abstractor of a German pharmaceutical paper, who evidently was not very familiar with the English language, without much ceremony described it as a "new remedy". The paragraph was copied by a number of German journals without quoting the original source. The result was that several American journals copied likewise and the article which early in the year was described in this country as a war relic, several months later paraded through our pharmaceutical journals as a "new remedy."

Definite information with regard to a new remedy: its chemical or botanical discovery, the time when firs applied therapeutically, the spread of its use etc. is not only interesting but instructive. Misinformation can ofttimes become worse than useless. Whatever excuse there may be for sinning in this direction, carelessness certainly cannot be construed as sufficient excuse in compiling a list of new remedies that have been or are supposed to have been introduced during a given year.

Americans are accustomed to look at everything German as being done with painstaking thoroughness at least. If, however, a German pharmaceutical journal enumerates a preparation as being introduced in 1896 and at the same time refers the reader to another number of the same journal where the reader will find the statement that this "new remedy" has dropped from use, it is time to call attention to such carelessness. Lists of new remedies introduced in a given year are very instructive and if correct may become valuable historically. But if carelessness is their characteristic, they become worthless rubbish, or even worse than worthless. Why secret preparations and nostrums should be dignified by naming them "new remedies" and thus according them a place in our materia medica, may not be readily comprehensible to some, though the trend of modern pharmacy might justify this action in the eyes of many others. A revision of a list that has appeared about the middle of last and at the beginning of this year may not be out of place. It may not be possible in most cases to go back to original authorities, yet it will no doubt be instructive to point out a number of misstatements. This, it is hoped, will lead to a more careful handling and treatment of the subject of new remedies in the future.

Organic Chemicals.

Acidum boro-benzoicum. The reviewer credits Merck's Market Report, 1896, p. 89 as the source of his information. The writer of the Market Report refers to boro-benzoic acid as to an article known at least for some time to the drug market, but mentions no other authority.

The acid seems to be of the type of the boro-salicylic and boro-citric acids. Both editions of the National Formulary contain a sodium boro-benzoate, which is directed to be prepared by intimate mixture of sodium borate and sodium benzoate.

Acidum glycerino-phosphoricum. The information is taken in part from Merck's Bericht über das Jahr 1895. Merck states that the acid was introduced therapeutically by Pasqualis and Robin, evidently in 1893, and that the calcium salt as nervine tonic had taken special footing in France during 1895. The Pharm. Ztg., 1896, p. 368, reports on an improved method for the preparation of this acid and its salts, their properties and administration. Neither the acid nor its salts, nor their therapeutic use is new.

Actol. At a meeting of the Gesellschaft für Natur- und Heilkunde zu Dresden Dr. Credé reported on Jan. 25, 1896 with regard to the use of silver in surgical and bacteriological application. The silver lactate was prepared at his request by Dr. Heyden of Radebeul. Whether it was the physician or the chemist who substituted the name actol for the simple and expressive chemical term does not become apparent from the report of the address in the Therapie d. Gegenwart, 1896, p. 236. (14, p. 111).

Alkaloidal Stearates. The stearates of morphine, atropine, and cocaine were reported on by Francesco Zanardi in the Bulletino chimico farmaceutico for 1896. They were introduced to take the place of the mixtures of these alkaloids with fats. (14, p. 114).

Amyloform. This compound first prepared by Prof. Classen of Aachen, by the action of formic aldehyde on starch, has been introduced during the past year by the firm Rhenania, (Pharm. Ztg., 1896, p. 564 and Pharm. Centrh., 1896, p. 801). When the compound was first prepared by Classen is not mentioned.

Amylum iodatum. Iodized starch was officinal in the U. S. P., 1880, but was dropped in the ed. of 1890. That Dr. Majewski recommended it anew in the Wiener Med. Pr., 1896, 19, seems to have been sufficient reason to enumerate it as a new remedy introduced during the past year.

Anagyrinum hydrobromicum crist. The information is obtained from Merck's Bericht für 1895. In the report for 1894 Merck calls attention to this salt stating that the alkaloid was first prepared by Hardy and Gallois, and refers to the publication of the Soc. de biolog. for 1895 and to the Journ. de Pharm. et Chim. for 1889. The physiological examination of the alkaloid is said to have been made by these investigators together with Bochefontaine and Gley. Whether the free alkaloid or the hydrobromide were used is not mentioned. In the Report for 1895 Merck states that the former fragmentary communications were supplemented by A. Coutrest in 1892 (Thèse de la faculté de Méd. de Paris 1892, No. 321). Even if the scientific horizon of the compiler of the list were identical with the German boundary, his date would be incorrect by two years.

Anusol. According to C. Weinreben, proprietor of the Buchka'sche Hof-Apotheke in Frankfurt a. M. this name is a synonym for iodo-resorcin-sulphonate of bismuth. (Parm. Ztg., 1896, p. 695; and Pharm. Centrh., 1896, p. 718). Both data and references as to when the compound was first prepared are not given.

Atropine iodate. The Pharm. Post for 1895, p. 537, contains an abstract from the Therap. C. Bl. with reference to the use of atropine iodate as a mydriatic. (14, p. 92).

Bismal. The bismuth salt of methylene digallic acid is described by Merck in his Report for the year 1895. This report, however, was published in 1896, hence the misstatement as to the year.

Bismuthum loretinicum. This is described in Merck's Bericht for 1894 as the bismuth compound of loretin, orthooxyquinoline-meta-iodo-ana-sulphuric acid. In this report the drying effect of the compound when applied externally is mentioned. In the report for the year 1895 attention is called to the results of W. Nicati (Sem. médicale, 1895) who has used it in ophthalmology.

Bromosinum. Compounds of bromine and iodine with albumen were prepared almost simultaneously by the apothecary Dr. Reiss of Augsburg, (Pharm. Ztg., 1896, p. 782), and by the apothecary Hunrath of Cassel, (ibidem, p. 796). The bromine compound of the latter was introduced under the above name as a powder with a guaranted bromine content of 10 p. c.

Bryonin. The well known glucoside of bryony root was examined by J. M. Schaller. (The Alkaloid, 1894,

p. 155.) The Am. Med. & Surg. Bull. for 1895 reported on this article and caused Merck to mention the results in his Report for 1895. Hence a therapeutic examination of a well known drug made evidently in 1894, but brought to the notice of the compiler at the beginning of last year, caused it to be enumerated as a new remedy introduced during the year 1896.

Caffeine iodol. The Pharm. Ztg., 1896, p. 497 refers to the Zeitsch. d. allg. oestr. Apth. Ver., (50, p. 533) as the source of its information. From the data there given it does not become apparent whether the substance is a chemical compound or not, nor when or by whom it was introduced.

Calcium carbide known chemically for some time is stated to have been recommended as a hæmostatic by Aimé Guinard. (Pharm. Ztg., 1896, p. 453; from D. Chem.-Ztg., Repert.)

Canadine. With regard to the chemical history of canadine, which is by no means altogether recent, consult the review of the subject by E. Schmidt in the Arch. f. Pharm., 232, p. 136.

Cannabinol is a toxic red oily substance, $C_{18}H_{24}O_2$, isolated by Wood, Spivey, and Esterfield from Indian hemp. It was examined physiologically by Marshall. The original chemical communication appeared in the May number of the Journ. Chem. Soc., for 1896, p. 545. A preliminary physiological report was made in the same journal, a more detailed report was to be made elsewhere.

Carissin, a glucoside, isolated from the bark of *Carissa ovata*, R. Br., var. *stolonifera*, by J. H. Maiden and H. G. Smith. The information is obtained from the Pharm. Journ., 1896, I, p. 83. In the Journal, which contains only an abstract on the page referred to, no reference is made to the original article, hence further investigation will be necessary to ascertain whether this glucoside was discovered in Jan. 1896, or earlier.

Carniferin. According to G. Arends (Pharm. Ztg., 1896, p. 42) this preparation made by the Farbenfabrik at Hoechst is an iron compound of sarcophosphoric and was introduced in 1895. Dr. W. S. Hall reported on the same in the D. Med. Ztg. for 1896.

Chininum sulphoichthyolicum, a compound obtained by double decomposition between quinine hydrochloride and ammonium sulphichthyolate. The reference given is incomplete.

Chinoform or **Quinoform.** De Vrij (Pharm. Weekblad, 1896, 44) so designates a precipitate obtained by the action of formic aldehyde and hydrochloric acid upon the aqueous extract of cinchona bark. It is supposed to be a condensation product of cinchotannic acid and formic aldehyde, analogous to tannoform.

Chinosol or **Quinosol.** The first reference in the Pharm. Ztg. is taken from the Zeitsch. f. Krankenpfl. 1895, III, hence this antiseptic must have been introduced before 1896. Dr. Ostermann in the Therap. Monatsh. 10, p. 155 states that the article, the chemical formula of which is given as $2(C_9H_6N.OSO_3K) + H_2O$, was patented by Franz Fritzsche & Co. of Hamburg, but does not mention the date of the patent.

Coronillin. In No. 1 of the Revue méd. de la Suisse rom. for 1896, Prevost of Geneva reports on his pharmacological studies of coronillin. The article was abstracted for the Therap. Monatsch. for May 1896, p. 285. Prevost, however, calls attention to the fact that his results substantiate those of Schlagdenhauffen and Reeb (Journ. de Pharm. d'Alsace-Lorraine 1888—1893), and also mentions the work of Spillmann and Haushalter (Gaz. hebdom. 1893, 23 & 24). Coronillin, therefore, was not introduced as a new remedy during 1896, neither is the observation that it is a heart poison like digitalin, new.

Diiodosalicylicacidphenylester or diiodosalol was patented by E. Herzfeld, possibly in 1896. No other data pertaining to time of introduction than number of patent are given.

Diiodocarbazol was possibly introduced by Zimmer & Co. of Frankfurt a. M. during January 1896 or earlier (Pharm. Ztg. 1896, p. 90). It was patented by A. Classen about two years earlier, the German patent being dated May 27, 1894. (Ber. 28, p. 699.)

Erythrol tetranitrate. Bradeury reported on this and similar compounds evidently in the Wiener med. Blätter for 1895, p. 779. (14, p. 140.)

Eucaïne hydrochloride, the new local anaesthetic, is the salt of benzoyl methyl tetramethyl-μ-oxypiperidine carbonic acid methyl ester and was introduced evidently in 1896 by the Chem. Fabrik a. Akt. (vorm. E. Shering) of Berlin.

Eucaseïn. The ammonia salt of caseïn can be prepared directly in solid form by passing ammonia over dry, pulverized caseïn, or suspending caseïn in such liquids in which neither it nor its salts are soluble (alcohol, ether, benzene, petroleum ether, etc.) and passing ammonia into the mixture as long as the gas is absorbed. This process was patented by. E. Salkowski and W. Majest, evidently in 1896. (Zeitsch. f. angew. Chem., 1896, p. 176). (14, p. 140.)

(To be continued.)

Literary.

Books and Pamphlets Received.

University of Wisconsin — Madison. Analytic Keys to the Genera and Species of North American Mosses. By Charles Reid Barnes. Revised and extended by F. D. Heald with the cooperation of the author. Bulletin of the University of Wisconsin. Science Series, Vol. 1, No. 5, pp. 157—368. 1897. $1.00.

Julius Springer — Berlin. Vierteljahresschrift über die Fortschritte auf dem Gebiete der Chemie der Nahrungs- und Genussmittel, der Gebrauchsgegenstände sowie der hierher gehörenden Industriezweige. Unter Mitwirkung von Fachgenossen redigirt von Dr. A. Hilger. Elfter Jahrgang. Das Jahr 1896. Drittes Heft, pp. 311–466. 1896. M. 3.00.

Nitschke Brothers—Columbus, O. Pharmaceutical Interrogations. A list of classified questions upon subjects pertaining to pharmacy, accompanied by references to standard authorities. For the use of students. By Prof. J. H. Beal, Principal of the Department of Pharmacy of Scio College, Scio, Ohio. 1896.

Author. — Camphoric Acid. Fourth paper. By W. A. Noyes, Professor of Chemistry of the Rose Polytechnic Institute. Reprinted from the Am. Chem. Journ. Pamph., pp. 11.

Author. — 1. Notes on the Flora of Western Iowa; 2. Some Notes on chromogenic bacteria; 3. Fungus diseases of plants at Ames, Iowa, 1895; 4. Some anatomical studies of the leaves of Sporobolus and Panicum. By L. H. Pammel. Reprinted from the Proc. of the Iowa Acad. of Sc. for 1895. Pamphlet, pp. 56.

Authors. — A contribution on the gases produced by certain bacteria. By L. H. Pammel and Emma Pammel. Reprinted from Centrbl. f. Bakt., Parasitenkd. u. Infektionskrankheiten. Pamphlet, pp. 16, with one plate.

Author.—Some notes on grasses collected in 1895, between Jefferson, Iowa, and Denver, Colorado. Reprinted from the Proc. of the Soc. for the Promotion of Agr. Sc. 1896. Pamphlet, pp. 10.

Author — Scio, Ohio. 1. Pharmacy laws of the United States—A comparative exhibit. 2. What is the best method of bringing about greater uniformity in pharmacy legislation in the different states. By J. H. Beal. Reprinted from the Proc. of the A. Ph. A., 1896. Pamphlet, pp. 29.

Author — Chicago, Ill. Shall alcohol employed in manufactures and the arts be tax-free. Address before the joint committee of the U. S. Senate and the House of Representatives on the alcohol tax in session in N. Y. City, Dec. 3, 1896. By George P. Engelhard, representing committees of national, state and local associations of retail druggists. Pamphlet, pp. 11.

Author—Brooklyn. Volumetric determination of acetone. By Edward R. Squibb. Reprinted from J. Am. Ch. Soc., Pamphlet, pp. 12.

Author — Cambridge. A sketch of cryptogamic botany in Harvard University 1874—1896. By W. G. Farlow. Pamphlet, pp. 16.

Author — New York. An analysis of the negative forces that are disintigrating our State Pharm. Assn., and of the reconstructive methods that will tend to re-establish it on a permanent foundation. President's annual address. New York Pharmaceutical Association. By George J. Seabury. Phamplet, pp. 19.

Schering & Glatz — New York. Glycerophosphoric acid and salts and their uses, Pamphlet, pp. 12.

Reviews.

The Principles of Theoretical Chemistry, with special reference to the constitution of chemical compounds. By Ira Remsen, Professor of Chemistry in the Johns Hopkins University. Fifth edition. Thoroughly revised. One vol., 12mo, pp. x, 326. Lea Brothers & Co., Philadelphia. 1897. $2.00.

The importance of the study of chemistry has been recognized in this country to such an extent that at least an elementary course is offered by all universities and colleges and even by no small number of high schools. The significance of the laboratory method of instruction has also been recognized. There was a time not very long ago when a number of schools, including colleges of pharmacy and medicine, attempted to teach chemistry by lectures and quizzes. To-day there are certainly but few institutions where instruction in chemistry is attempted without making at least some laboratory work obligatory.

Whereas commendable progress has been made in the instruction of elementary chemistry, only a limited number of the larger institutions of learning, principally the universities, offer liberal opportunities for advanced work. No doubt, school-boards and trustees have been so liberal in granting funds for elementary work, because chemistry is popularly regarded as one of the useful sciences which can be turned into money. The need for advanced work has not been recognized to anything like the same degree. This will account in part for the fact that the demand for teachers especially in secondary schools has been greater than the supply of competent instructors. Many of our normal schools to-day carry into practice the idea that a student who has had a twelve weeks course in chemistry makes a competent teacher.

Under these conditions it must certainly be gratifying to the author of a treatise on theoretical chemistry to find that his work is appreciated to such an extent that a fifth edition is already called for. A book that assists in creating a desire and a position demand for something more than a merely elementary experimental course in chemistry certainly accomplishes an excellent mission in this country. The fact that the work has been translated into German and Italian, though gratifying to the author, is of less importance to us as a people. Americans, in very large numbers, have gone abroad to get their higher chemical education. The migration to European universities has been an excellent thing for American education in general. There is no reason, however, why American universities should not offer courses in chemistry as good as those offered by German universities. Only after they do may we expect better chemical instruction in our high-schools, academies and even colleges.

The principles of theoretical chemistry as well as their author are so well and so favorably known in this country that a discussion of the contents of the book seems almost uncalled for. Although the recent development of physical chemistry tempted the author to materially change the character of the book, he has refrained from so doing, and has thoroughly revised the fourth edition along the old lines and brought it up to date. The new edition will be wellcomed not only by teachers and students of chemistry, but also by the large number of chemists whose routine duties tend to draw them away from the fountain of their science. A book of some three hundred pages can be read with pleasure and profit in the leisure hours of a busy chemists life. *E. K.*

Einführung in das Studium der Alkaloide mit besonderer Berücksichtigung der vegetabilischen Alkaloide und Ptomaïne. Von Dr. Icilio Guareschi. Mit Genehmigung des Verfassers in deutscher Bearbeitung herausgegeben von Dr. Hermann Kunz-Krause. Erste Hälfte, pp. v, 304. Hermann Heyfelder, Berlin. 1896.

Pharmacists, who aspire to be something more than mere venders of drugs and druggists' sundries, but who despair of ever attaining a higher position for their calling we would advise to read the historic introduction to the above monumental treatise. The names of Sertuerner, Pelletier and Caventou and the record of what they accomplished at the beginning of this century should inspire even the pessimistic to make one more effort at least to redeem a calling that is at present passing through an exceedingly unenviable stage in the course of its development. Being deprived almost entirely of its former prerogative—if the pharmaceutical and chemical manufacturer are considered to be outside the pharmaceutical fraternity proper—the general practitioner has not yet adapted himself to present social and economical conditions. The history of the alkaloids should teach him that the field of research is still open to all and that its area is larger than ever. The classic work of the three pharmacists enumerated above certainly ought to afford inspiration for all times. The fact that both authors of the work at hand are pharmaceutical chemists demonstrates sufficiently that the subject of alkaloids has not only not suffered in interest for the pharmaceutically inclined investigator, but also that pharmacists can at the close of this century as well as at the beginning accomplish something in this field that is both classic and monumental.

The work of which the first half lies before us and of which the second half is to appear soon constitutes a monograph of about six hundred double column quarto pages and is throughout a fine specimen of excellent book-work.

The special part, which follows the very interesting introduction is divided into five parts dealing respectively with: bases with open chains; bases with closed chains; metallic amines; alkaloids proper; and ptomaïnes and leucomaïnes. Groups four and five are only of a temporary nature. As fast as the constitution of their members have been determined these are added to groups one or two respectively.

A classification of organic compounds containing nitrogen is no easy matter at present. There can be but little doubt that the classifications adopted by most text-books are bad. The authors have adopted a system different from that generally used and hope to have supplied the student with something in this direction that will lead him to think for himself. This is certainly commendable, probably more so than the system they themselves have adopted. About the latter opinions certainly seem to be at variance.

The Italian author wrote the book because there was nothing like it in his language. The German translator and revisor undertook the work, because even German chemical literature was not in possession of such a treatise. It scarcely seems necessary, therefore, to add that our chemical and pharmaceutical literature is still wanting a like monograph on this very important subject. Those who read German will, no doubt, thank the translator for having not only translated Guareschi's work, but also for having brought it up to date. *E. K.*

Dictionnaire de Physiologie par Charles Richet, Professeur de Physiologie à la faculté de Médecine de Paris. Tome deuxième, 1er fascicule. Baer (Karl Ernst von) — Bulbe. pp. 1—320. Félix Alcan, Éditeur, Paris. 1896. Fr. 8.50.

Those who are so fortunate as to possess volume one of this excellent dictionary, no doubt have been looking forward with considerable expectation, and possibly with some anxiety, to the appearance of part one of volume two. Their patience has at last been rewarded and the fascicle of more than three hundred pages, which constitutes almost a volume in itself, now lies before them and is found to be replete with interest. This excellent dictionary or rather encyclopædia deserves the widest possible distribution.

The new fascicle contains in all fifty articles, several of which are veritable monographs of about fifty and even more pages. Of the fifty articles seventeen are on chemical subjects. This number includes several alkaloids, benzene, benzoic acid, bromal, bromoform, bromides, and the elements baryum, bismuth, boron and bromine. Of the seven articles on physiology proper that on bile with sixty-five pages and the unfinished article on the medulla oblongata with fifty-five pages in this fascicle deserve special mention on account of the detailed treatment accorded them. Physics comes in with two articles, one on barometric pressure covering forty-seven pages; zoology with one; botany and pharmacognosy with two, viz. on belladonna and boldo; foods and beverages with three, viz. beer, bouillon and butter.

Biography comes next to chemistry as far as number of articles is concerned. Karl Ernst v. Baer, H. Beaunis, Charles Bell, Alex. Graham Bell, Claude Bernard, Paul Bert, Albrecht v. Bezold, Xavier Bichat, G. Bizzozero, E. du Bois Reymond, G. A. Borelli, C. Bourgelot, H. P. Boroditch, C. E. Brown-Séquard, E. v. Brucke, T. Lander Brunton are the ones mentioned. The bibliographic notices are as a rule painfully short, whereas considerable space is given to the classified enumeration of publications. Such a treatment may have its decided advantages; it is, however, not without its disadvantages. Although considerable attention is given to chemical subjects, as is strikingly demonstrated in this fascicle, yet E. Bauman, the late physiological chemist, who certainly has done much to assist in the solution of physiological problems, is not even mentioned.

Two articles of a more general nature remain to be mentioned: one on biology, the other on bibliography covering not less than forty-three pages. The author discusses briefly the utility of bibliography and then gives a detailed account of the rules of bibliographic technique. This is followed by a list of the principal treatises on physiology, of reports of physiological laboratories, published as volumes, and of journals. Finally considerable space is given to a detailed exposition of the decimal system of classification as applied to physiology.

This clearly shows that the editor has not shifted from his position as stated in the introduction to the first fascicle issued, viz. to make the work an all-comprehensive treatise on physiology. Certainly every one who is at all interested in this fascinating science will wish authors and publishers success in their great undertaking.

E. K.

Apothekerkalender für das deutsche Reich, begründet von Oscar Schlickum. 1897. Mit Anhang: Die Apotheken der Schweiz und Luxemburgs sowie einer offiziellen Zusammenstellung sämmtlicher Personal-Verhältnisse des Deutschen Apotheker-Vereins. Herausgegeben von Apotheker Fr. Kober, Redakteur der Süddeutschen Apothekerzeitung. Mit dem Bildniss von Adolph Frickhinger. Fünfzehnter Jahrgang. Verlag von Strecker und Moser, Stuttgart.

The number of "Apothekerkalender", each of which is a *multum in parvo*, published annually in Germany is something remarkable. These small volumes for ready reference which can be carried about in the pocket while working in the laboratory are very convenient indeed and appreciated by every one who has had occasion to use them. In Germany not only the apothecary, but the chemist, the engineer, in fact almost every calling has its own "Kalender". Besides the technical information boiled down in tables etc. they contain all conceivable valuable information from postage rates to the enumeration of holidays. More than that, there is sufficient space left for a short monograph or a biographical sketch with portrait.

E. K.

Allgemeine Waarenkunde. Handbuch für Gewerbetreibende. Unter Mitwirkung von Fachgenossen, redigirt von Josef Bersch. Ein Bd., pp. 952. A. Hartleben's Verlag, Wien, 1896. M. 10.00. Halbfranz Einbanddecke. M. 1.60. 1896.

The commercial and financial crisis through which we have recently gone and of which we still feel the effects, has emphasized the doctrine of the survival of the fittest. Though this doctrine by no means applies strictly to human affairs it is of sufficiant application to have stirred up not only individuals and communities, but entire nations. England affords us a striking example at the present time, while the people of the United States are still looking largely to the government for aid and relief. The need of better education and training, however, is felt the world over, not only in the learned professions, but in the humbler callings as well. A variety of schools have grown out of this demand. The need of literature has also been felt and partly applied. Technical papers and journals have multiplied in unprecedented manner. Monographs on almost all possible subjects have been written. The publishing house of Hartleben in Vienna is well known for its ever-growing series, already numbering several hundred, of monographs on scientific and technical subjects written in a popular scientific style. That this firm began the publication of an encyclopædic dictionary of all articles of commerce obtained from the three natural kingdoms was announced in this journal somewhat more than a half a year ago. The first numbers were also received about that time. Since then the fascicles — twenty in all — followed in rapid succession and the work now lies complete before us.

It comes fully up to earlier expectations. The development particularly of African colonies has brought into the market a host of new articles of commerce, many of which are of great interest and importance. The authors have taken great pains to bring the contents up to date. A work that is to cover a material so vast must of necessity be concise. For the average person who uses such a book this is an advantage. For the benefit of those who desire more detailed and systematic information a classified catalogue of the publisher's chemico-technical library is added. The two supplement each other admirably and will be found serviceable by all those who desire to move with the progress made since they left college, as well as by the larger contingent who not having had special training but desire to improve themselves by home study.

E. K.

Tabellarische Uebersicht der im Handel befindlichen künstlichen organischen Farbstoffe. Von Gustav Schultz und Paul Julius. Dritte vollständig umgearbeitete und stark vermehrte Auflage, herausgegeben von Dr. Gustav Schultz, Professor der chemischen Technologie a. d. k. techn. Hochschule zu Muenchen. Hermann Heyfelder, Berlin. 1897. M. 20.00.

The third edition of this work by the well-known author of the Chemistry of Coal-tar contains in tabular form the names and synonomy of five hundred and four artificial dye-stuffs, their structural formula wherever possible, the method of formation, the name of the discoverer and the year when discovered, the number of the patent or patents, references to the literature of the particular dye-stuff, and finally a brief description of its physical and chemical properties and its uses. The arrangement is based on chemical classification common in similar treatises.

Of the four-hundred and four dye-stuffs which were enumerated in the first and second editions eighty-seven were dropped because no longer in the market. On the other hand, one hundred and eighty-seven new ones were added. The old names, however, are again included in the index for historical reasons. Names of such dye-stuffs which appeared in the market recently, but could not be described in the text, are also added. The number of trade names by which the same dye-stuff is introduced by various manufacturers has been materially increased.

The importance of this class of chemicals makes this work, which seems to be indicative of accuracy as well as thoroughness, a very valuable one not only to the technical chemist and manufacturer who are interested in this particular field of chemistry and chemical technology, but to the general chemist as well. The fact that a previous edition has been translated into both Italian and English indicates that the value of the book is appreciated by others as well as by the Germans. The book should at least find a place in every organic chemical laboratory.

E. K.

Pharmaceutical Review.

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EDITORIAL.

Nothing can be more pleasing to scientists than the impetus research is receiving in England. The Davy-Faraday Research Laboratory which England owes to the munificence of Dr. Mond has received world-wide attention. American pharmacists have taken pride in the establishment of a pharmaceutical research laboratory, the Wellcome Research Laboratory, in London, by an American, and in the appointment of an American to the position of Director. Attention has been called to the establishment of fellowships and scholarships. How generally the English people have been stirred by the recognition of the fact that scientific research constitutes one of the pillars upon which even industry rests, is shown by the source from which some of the fellowships spring. The Chemist and Druggist now reports that the Leathersellers' Company, under the mastership of Dr. W. H. Perkin, voted a grant of 150 £ a year to be applied to founding one or more fellowships for the encouragement of higher research in chemistry in its relation to manufacturers. If the present movement continues, England may some day regain some of her former prestige as a manufacturer of chemicals.

There has been more or less rejoicing in late years over the constitutionality of pharmacy laws. One of the reasons why pharmacy laws were not more rigidly enforced lay in the doubt state boards had as to the constitutionality of the laws which they were appointed to enforce. Whenever a supreme court passed affirmatively on any law or even a single chapter of a state pharmacy law, there was rejoicing on the part of those in authority as well of those who desire to see their calling regulated by the state. Such has recently been the case in Illinois. Even one of the Chicago dailies commented on the decision and pointed to the public gain to be derived from a more thorough enforcement of laws for some time on the statute books, but largely inoperative for fear that the child might be poured out with the bath.

Yet in spite of like favorable decisions state boards and pharmacists in general seem to be easily frightened when lawyers threaten to carry a given case to the supreme court in order to make a test of constitutionality. They have been equally timid when governors violated the specific instructions of the law in the case of appointments. In Wisconsin and Illinois the governors have within recent years transgressed their power in this respect. The Minnesota pharmacists, whose nominating power was totally disregarded by their present governor, have been up in arms. Again the demon of questionable constitutionality has risen. The pharmacists seemed to take a bold stand for a time. Why they should be willing to abide by the decision of a senate committe it is difficult to understand, unless it is the fear that the present legislature might out of spite repeal the entire law. The question of fitness of the persons appointed by the respective governors does not come into consideration at all. Furthermore, these governors, if they really believed the law to be unconstitutional, would receive much more credit for the stand taken if they called the attention of the legislature to visible defects. As it is at present, they can hardly escape the criticism of seeking to appoint political favorites or even of being anarchical.

It is to be hoped that at least that part of the bill which does away in France with second class pharmacists and a third class termed herbalists will pass. Wherever these different classes occur, there has been no end of difficulty. Besides the inevitable tendency has been a downward one on part of the upper class or classes. Commercialization of the first class pharmacies in France has assumed such proportions that it has called for national legislation not so much to protect the pharmacist of the first class, but the public. It is to be hoped that the experience of France, Austria and Germany will serve as a lesson to other people. The sick have but little protection when most in need of it as long as quacks in medicine and pharmacy are licensed by governments to lure them by low prices and smooth words. Even the little experience that we have had in this country with the so-called minors has been far from satisfactory. At present attempts are to be made to secure uniformity in pharmaceutical legislation by the various states of the Union. Several suggestions have already been made including provision for different classes of pharmacists. It is to be hoped that nothing of such a nature will prevail.

Hermann Hager.

Dr. Hans Hermann Julius Hager died after prolonged illness at the home of his son in Neuruppin at the age of 81.

Hager's name has been a by-word in almost every pharmacy, no matter under which sun, in which the German language is understood. That his name has not been foreign to others as well is shown by the list of societies and corporations other than German of which he was an honorary member. The fact is that he was possibly even more favorably known abroad than at home.

The reason for this is not far to seek. A country in which everything seems to have been boiled down to a system is apt to look askance at a person who ventures to educate himself by following some other than the conventional path. This was true of Hager. The recognition which he ultimately received at home was largely through sheer strength of character.

Hager was born Jan. 3, 1816 at Berlin as the son of a military physician. He received private and public instruction including several years at the Gymnasium which he left in 1832 ready to enter the "Secunda". He entered the Loewen-apotheke in Salzwedel as apprentice. Inasmuch as he could not pay for his apprenticeship, he was expected to do the work of an errand boy and porter as well as that of an apprentice. The preceptor kept his books locked in a book-case where his subordinates had no access to them. Only two books, one of which was a pharmacopœia of the last century, were regularly accessible. They offered anything but an inspiration for study. So Hager used his school-books to perfect himself in the languages, in history and literature. By accident he found two chemical works, one without a title page, under rubbish in the attic, and by trickery he managed to secure for a few days at a time the fascicles of the Archiv für Pharmacie which his preceptor received as regular subscriber. Although neglected and abused, Hager made such excellent use of the very meagre facilities that at the end of his apprenticeship he was excused from the assistant's examination with an excellent recommendation from the district examiner.

In several positions which Hager held as assistant he found likewise meagre literary facilities and his income of from 210 to 240 marks did not permit him to buy books. This frequently led to the study of botany in the field. In Breslau he served a year with the military under the direction of his father. Here he also attended as a visitor lectures on historical, scientific and medical subjects. His fifth year as assistant he spent with an apothecary in Perleberg whose large library was at his disposal. Inasmuch as Hager did not have the means to attend the university, he considered the thought of leaving pharmacy and becoming a chemist. It happened that a former schoolmate who was getting ready for his final state board examination entered the same pharmacy as assistant. Hager studied with him and thus became well acquainted with the general range of knowledge expected in such an examination. His friend having successfully passed the examination, Hager took courage and presented himself to the examining board. None of the regular students, however, cared to be examined with him and so Hager was compelled to look about for two less dignified candidates who had failed at their first attempt. Whereas the visiting pharmacists, who attended the final public examination, seemed to have no good word for him, the examining board passed him with the predicate "very good".

For seventeen years Hager owned and conducted a pharmacy in Fraustadt. In 1859 he sold his pharmacy and moved to Berlin to devote his time exclusively to chemistry and pharmaceutical literature. Desirous of more quiet he withdrew as it were to Pulvermuehle, near Fuerstenberg a. O. In 1881 he removed to Frankfurt a. O. and later to Neuruppin.

If one looks into the lives of some of the great men German pharmacy has produced during the past century, one is surprised at the lack of opportunity, the almost utter absence of facilities for study which some of them had to contend with.

One is inclined to ask how such a system could produce such men. The only answer is that the men became what they were or are in spite of the system. The three and more years of apprenticeship without literary or laboratory facilities, with no inspiration, but under constant check on the part of the rigid preceptors, are comparable to the rocky and barren soil on which the Puritans landed. Such conditions and surroundings may assist in moulding a sturdy race, but any other than a sturdy people would perish. The New England country did not so much make the Puritans, the Puritans made New England.

If it were not known that Hager was active in a literary capacity, writing literary bits for local papers some time before he published any of his scientific results, one might be inclined to suppose that the absence of books in the shops in which he served his time as apprentice and assistant spurned him to supply a demand which he himself had so keenly felt. No doubt this did influence him, but on the other hand it becomes apparent that Hager worked and wrote because he must. He seems to have yielded to an inner pressure. It is said of the artist that his conception is relieved by childbirth only. This, no doubt, is true of literary and scientific men as well. They do the inevitable, it is the only natural course.

There can be no doubt that Hager made the most of his gifts and opportunities. His works, though skeptically received at first by many, have found their reward. "What good can come from Nazareth" is a saying that does not seem to grow stale. How dare a county apothecary write commentaries on the pharmacopœia and what good can a would-be scientist accomplish who has never been a regular student at a university. Hager's works have spoken for themselves and at least one German university honored the writer.

Yet it must be conceded that Hager was less a scientist in the modern sense of the term than an empiricist and compiler. This statement, however, need not involve a lack of appreciation of what Hager has done, neither does it justify those who discredited him unduly. It may, however, assist in throwing light upon the life and work of Hager.

Hager has not discovered any great truth; he was no philosopher; neither was he a brilliant experimenter. He was rather what Prof. Lloyd in his Study in Pharmacy terms a rational empiricist. Just where in actual practice the division line is to be drawn between rational empiricism and science is, no doubt, difficult if not altogether impossible to say. In a general way, however, Hager belonged to the former type of investigators.

This is no reason for discrediting him or his work. The fact is that he deserves all the more credit for having accomplished such remarkable results in spite of the early lack of opportunities for study. Even the German Apothecary Society at last honored the prophet in his fatherland by making him honorary member at the time of his fiftieth anniversary as apothecary.

A peculiar difference between England and Germany has been frequently noted by students of education and investigation. Whereas Germany seems to draw most if not all of her eminent scientists to her centers of learning, her universities, at English universities these men are conspicuous largely by their absence. Whatever lesson this state of affairs may teach in a general way, it may also help to explain Hager's position among the Germans. Not having completed the Gymnasium, never having been a student in regular attendance at a German university, these very facts, whatever his attainments and positive results, practically excluded him from entering university circles as teacher, investigator or writer. Outside this circle his task was doubly difficult.

Dr. Hermann Hager.

Yet he has been successful, and whatever criticism just or unjust has been showered upon him, he died respected and honored by most if not all who knew him or merely knew of him. The example of his life should help to inspire others to make more of their time and capacities than they are doing. Truly, it is more difficult to-day to acquire equal prominence under like disadvantageous circumstances, but Hager's life teaches and preaches: "Where there is a will, there is a way." Pharmacy is in need of just such men. If we could only couple such will power with the best education and training and with modern facilities for work, the future of pharmacy would appear brighter than it does.

E. K.

ORIGINAL CONTRIBUTIONS.

Medicinal Plants of Brazil.*

By *Dr. Theodor Peckolt of Rio de Janeiro.*

Aydendron riparium Nees. Dieser Baum findet sich im Staate Amazonas und heisst *Paó rosa* wegen der hellrothen Farbe des Holzes. Er findet keine medicinische Verwendung, doch wird das dauerhafte Holz zu Bauten und Möbeln benutzt. Ebenso

Aydendron canella Meissn. welcher in den Nordstaaten als *Paó de canella* und *Canella caixeta* — Kistenholz — bekannt ist, da das bräunliche Holz fast ausschliesslich zu dünnen Brettern für Kisten etc. verarbeitet wird.

Aydendron tenellum Meissn. Ist in den Staaten Alagôas und Ceará als *Canella amarella de cheiro* und *Louro amarella de cheiro* — Wohlriechender Zimmt- und Lorbeerbaum bekannt. Es ist ein Baum von 6—8 Meter Höhe mit dünnen herabhängenden Aesten. Die Blätter sind länglich-lancettlich, zugespitzt, oberseits lebhaft grün, unterseits gelbgrünlich. Die Rispe besteht aus weissen, wohlriechenden Blüthen. Die Beere ist oval, 11 mm. lang, von violettrother Farbe.

Das Decoct des Holzes — 30 Gramm zu 240 Gramm Colatur — dient als magenstärkender und blutreinigender Trank. Das gelbe, wohlriechende Holz dient zu Bauten und ist für Möbel sehr gesucht. Es hat auch die vorzügliche Eigenschaft, dass es von dem *Cupim* (Termite) nicht beschädigt wird.

Aydendron? suaveolens Nees. In den Staaten S. Paulo und Minas als *Cajaty* bekannt. Es ist ein kleiner Baum mit länglich-lancettlichen, abgestumpften Blättern. Die Beere ist 2 cm. lang und ist ebenso wie die Blätter von angenehm aromatischem, etwas lorbeerähnlichem Geruch.

Die Tinctur der Früchte dient als Carminativum. Das Oel der Früchte wird zu Einreibungen bei Rheumatismus verwandt. Die Infusion der Blätter mit Zucker ist ein Volksmittel bei Husten.

Aydendron? Cujumary Nees. Im Staate Amazonas unter der Indianerbenennung *Cujumary*, *Cucumary* und *Cuchery* bekannt. Ein hoher Baum mit dicker, rissiger, korkartiger Rinde und länglich schmalen, fein zugespitzten Blättern. Die farbige Rispe hat ovale, 14 mm. lange, eichelähnliche Beeren, deren Samen sehr ölreich sind und einen noch stärker aromatischen Geruch als Pichurim besitzen. Dieselben dienen den Waldbewohnern als Universalmittel bei Magenschwäche, Magenkrampf, Unterleibsbeschwerden und Rheumatismus. Gepulvert, in der Dosis von 2 bis 3 Samen, haben letztere den Ruf als Aphrodisiacum. Im Dialekte der *Botionden* heisst *Cujumary* Beischlaf. Rinde und Holz besitzen kein Aroma; letzteres ist ein vorzügliches Bauholz.

Aydendron riparium Nees. This tree is found in the state Amazonas and is called *Paó rosa* on account of the light red color of the wood. It is not used medicinally, but the durable wood finds use for buildings and for furniture. Likewise

Aydendron canella Meissn. which in the northern states is called *Paó de canella* and *Canella caixeta* — box wood — because the brownish wood is worked up almost exclusively into thin boards for boxes, etc.

Aydendron tenellum Meissn. Is known in the states Alagôas and Ceará as *Canella amarella de cheiro* and *Louro amarella de cheiro* — fragrant cinnamon and laurel tree. This tree reaches a height of 6 to 8 meters and has slender drooping branches. The leaves are oblong-lanceolate, acuminate, on the upper side bright green, on the under side yellowish green. The paniculate inflorescence consists of fragrant, white flowers. The berry is oval, 11 mm. long, of a violet-red color.

The decoction of the wood, 30 grams to 240 grams of colature, is used to strengthen the stomach and purify the blood. The yellow, fragrant wood is used for buildings and is much sought for furniture. It has also the excellent property of not being attacked by the *cupim* (termite).

Aydendron? suaveolens Nees. In the state S. Paulo and Minas known as *Cajaty*. It is a small tree with oblong-lanceolate, blunt leaves. The berry is 2 cm. long and like the leaves has an agreeable, aromatic, somewhat laurel-like odor.

The tincture of the fruit serves as carminative. The oil from the fruits is rubbed in for rheumatism. The infusion of the leaves with sugar added is a folk remedy for coughs.

Aydendron? Cujumary Nees. Is known in the state Amazonas by the Indian names *cujumary*, *cucumary* and *cuchery*. A tall tree with thick, fissured, corky bark and narrowly oblong, small, acuminate leaves. The colored panicle has oval, acorn-like berries, 14 mm. long, the seeds of which are very rich in oil and have an aromatic odor stronger than pichurim. These serve the forest inhabitants as a universal remedy for weakness of the stomach, stomach cramp, abdominal troubles and rheumatism. When powdered, 2 or 3 seeds given at a dose, these latter are regarded as aphrodisiac. In the dialect of the *Botionde*, *cujumary* signifies cohabitation. The bark and wood have no aroma; the latter is an excellent wood for buildings.

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* Continued from p. 27. Translated for the Review by Dr. R. H. True, Asst. Prof. of Pharmacognosy at the University of Wisconsin.

Mespilodaphne organensis Meissn. Dieser Baum kommt auf dem Orgelgebirge im Staate Rio de Janeiro vor. Er heisst gewöhnlich *Canella parda* — brauner Zimmt — in einigen Districten auch *Canella goiaba* und *Canella garauna*. Er erreicht eine Höhe von 10 bis 15 Metern. Die Blätter sind lederartig, elliptisch, zugespitzt und glatt. Der Blüthenstand besteht aus kleinen Rispen mit weissgrünlichen wohlriechenden Blüthen. Die Beere ist rundlich, röthlich, bis zur Mitte von der Cupula umschlossen. Der Baum blüht im Juni.

Die geruchlose Rinde dient als Adstringens. Das gelbbräunliche Holz dient nur zu Bauten, wo es nicht der Feuchtigkeit ausgesetzt ist, vorzugsweise zu Plafondbrettern. Nach Saldauha hat es ein sp. Gew. von 0.609 bis 0.800; nach Dr. del Vechio 0.927.

Mespilodaphne opifera Meissn. Dieser Baum findet sich in den Staaten Alagoas, Pará und Amazonas und ist *Canella de cheiro* und *Louro de cheiro* — wohlriechender Zimmt- und Lorbeerbaum — benannt.

Der Stamm ist dünn und hoch. Die Blätter sind gross, langgestreckt, länglich. Die Blüthenrispe ist achselständig, straussartig, weissgrau und befilzt. Die Beere ist klein, eiförmig, bis zur Mitte von der Achse umhüllt, von hellgelber Farbe und stark aromatischem Geruch und Geschmack.

In Manaos wird aus den Früchten durch Destillation ein aetherisches Oel bereitet, welches für hohen Preis verkauft wird. Es ist gelb und dünnflüssig. Der Geruch ist angenehm und ähnelt dem einer Mischung von Sassafras, Lorbeer und Rosmarin. Sp. Gew. bei 13° C. = 0.864. Es soll Caoutchouc lösen.

Die Tinctur der frischen Blätter wird in der Dosis von 6 bis 10 Tropfen bei Cardialgie, Kolik, etc. verabreicht. Die gestossenen Beeren mit Oel digerirt und dann ausgepresst liefern ein Präparat, welches zu Einreibungen bei Rheumatismus als Volksmittel vielfach benutzt wird. Das Holz ist fest und dauerhaft und wird zu Bauten verwendet. Sp. Gew. = 0.897.

Mespilodaphne Sassafras Meissn. Kommt in den Staaten Espirito Santo und Rio de Janeiro vor und ist unter den Volksnamen *Sassafraz*, *Canella sassafraz* und *Canella funcho* — Fenchelzimmt — bekannt. Der Baum ist 15 bis 20 Meter hoch, besitzt eine glatte Rinde und hat schnurgerade, wirtelförmig stehende Aeste, die Wirtel mit 6 bis 12 lederartigen, glatten, verlängert-lancettlichen, an der Basis zugerundeten Blättern. Die traubige Rispe besteht aus kleinen, weissen, wohlriechenden Blüthen.

Die Beere ist länglich eiförmig, glänzend gelbröthlich, einer kleinen Eichel täuschend ähnlich, bis zur Hälfte von der Achse umgeben. Blüht im November, die Frucht reift im Mai.

In der Flora brasiliensis wird bemerkt, dass die Frucht unbekannt ist. Ich habe dieselbe im Jahre 1858 als No. 45 an Dr. v. Martius gesandt. Alle Theile des Baumes sind aromatisch, am geringsten die Blätter. Aus 50 Ko. der frischen Blätter erhielt ich durch Destillation nur 2.750 Grm. aetherisches Oel. Es ist von hellbräunlicher Farbe, angenehm, etwas lorbeer-ähnlichem Geruch. Sp. Gew. 25° C. = 1.035. Iod löst sich sogleich ohne Temperaturerhöhung, eine dicke olivengrüne Flüssigkeit bildend. Sandelroth löst sich mit orangerother Farbe. Werden einige Tropfen Schwefelsäure zugefügt, so

Mespilodaphne organensis Meissn. This tree is found in the Organ Mountains in the state Rio de Janeiro. It is usually called *Canella parda* — brown cinnamon — in certain districts also *Canella goiaba* and *Canella garauna*. It attains a height of 10 to 15 meters. The leaves are leathery, elliptic, acuminate and smooth. The inflorescence consists of small panicles of greenish-white flowers. The berry is roundish, reddish, enclosed in a cupule to the middle. The tree blooms in June.

The odorless bark serves as an astringent. The brownish-yellow wood is used in buildings where it is not exposed to the moisture, especially as boards for ceilings. According to Saldauha it has a specific gravity of from 0.609 to 0.800; according to Dr. del Vechio 0.927.

Mespilodaphne opifera Meissn. This tree occurs in the states Alagoas, Pará and Amazonas and is called *Canella de cheiro*—fragrant cinnamon — and *Louro de cheiro* — laurel tree.

The stem is slender and tall. The leaves are large, elongated, oblong. The floral panicles are axillary, bouquet-like, grayish-white and tomentose. The berry is small, ovate, surrounded by the axis to the middle, of bright yellow color and strongly aromatic odor and taste.

In Manaos an ethereal oil is produced by distillation which commands a high price. It is yellow and thinly fluid. The odor is agreeable and resembles a mixture of sassafras, laurel and rosemary. Spec. grav. at 13° C. is 0.864. It is said to dissolve caoutchouc.

The tincture of the fresh leaves is given in doses of from 6 to 10 drops in cardialgia, colic, etc. The bruised berries, digested with oil and expressed, furnish a preparation much in use as a popular remedy rubbed in in rheumatism. The wood is firm and durable and is used in buildings. Spec. grav. 0.897.

Mespilodaphne Sassafras Meissn. This occurs in the states Espirito Santo and Rio de Janeiro and is known by the popular names *Sassafraz*, *Canella sassafraz* and *Canella funcho* — fennel cinnamon. The tree is 15 to 20 meters high, has a smooth bark and very straight, verticillately arranged branches; the whorls with 6 to 12 leathery, smooth, elongated-lanceolate leaves with rounded bases. The racemose panicle consists of small, white, fragrant flowers.

The berry is oblong-ovate, shining, reddish-yellow, misleadingly like a small acorn, half surrounded by the axis. The tree blooms in November, fruit ripens in May.

In the Flora Braziliensis it is noted that the fruit is unknown. I sent the same in 1858 to Dr. v. Martius as No. 45. All parts of the tree are aromatic, the leaves least of all. By distilling 50 k. of the fresh leaves, I obtained only 2.750 grams of ethereal oil. It is of light brown color and has a pleasant, somewhat laurel-like odor. Spec. grav. at 25° C. 1.035. Iodine dissolves immediately without increase of temperature, forming a thick, olive-green fluid. Sandal-red dissolves with orange-red color. The addition of a few drops of sulphuric acid causes an explosive reaction entsteht eine explosionsartige Reaction und es bildet sich ein schwarzes bröckeliges Harz von sabinaähnlichem Geruch. Pikrinsäure löst sich schnell mit dunkelgelber Farbe und rosmarinähnlichem Geruch. Mit Schwefelsäure färbt sich das Oel ziegelroth, dann eine dunkelviolette, harzartige, weiche Masse bildend. Mit Salpetersäure färbt sich das Oel dunkelgrün, die Säure hell carminroth.

Mit rauchender Salpetersäure tritt eine explosive Reaction ein mit purpurrother Färbung. Nach drei Stunden zeigten sich an der Oberfläche sehr kleine silberglänzende Krystallnadeln. Dieselben sind wenig löslich in Alcohol vom sp. Gew. 0.900; in solchem vom sp. Gew. 0.860 in allen Verhältnissen löslich.

20 Kilo frischer Blüthen lieferten durch Destillation 1.950 Grm. ätherisches Oel = 0.009 p. c. Es ist grünlichschillernd, dünnflüssig, von angenehm, etwas jasminähnlichem Geruch. Sp. Gew. bei 15° = 0.836.

Aus 20 Kilo der frischen gestossenen Rinde wurden 20 Grm. ätherisches Oel (= 0.2%) erhalten. Es ist gelb, dickflüssig, von angenehmem, etwas myrtenähnlichem Geruch und aromatisch campherähnlichem, schwach bitterem Geschmack. Sp. Gew. 0.973 bei 15° C. Wird das Oel mit Schwefelsäure erwärmt so entwickelt sich ein starker campherartiger Geruch.

20 Kilo lufttrockener Sägespäne lieferten 180 Grm. eines hellbräunlichen ätherischen Oeles von angenehmem, etwas fenchelartigem Sassafras Geruch und von scharfem, gewürzhaftem, wenig brennendem Geschmack. Sp. Gew. 1.055 bei 25° C.

Dieses Oel hat hier grossen Ruf als Einreibung bei neuralgischen Schmerzen und Rheumatismus, ferner als wirksames Antidot bei Schlangenbiss. Viertelstündlich werden 3 bis 6 Tropfen mit einem Esslöffelvoll Zuckerbranntwein eingenommen und Baumwolle mit Oel getränkt wird auf die Bisswunde gelegt. Die hiesigen Tabaksfabrikanten benutzen das Oel den Cigarettentabak zu aromatisiren und wohlschmeckend zu machen.

Die lufttrockenen Sägespäne verlieren 12% Wasser und geben 1.55% Asche. Sie enthalten: 1) 0.4 Procent eines hellgelben Weichharzes von Terpentinconsistenz, scharf gewürztem Geschmack und angenehmem Geruch, ähnlich einer Mischung von Sassafras und Terpinol. Es verbrennt mit lebhafter Flamme ohne Rückstand. Es ist löslich in Benzol, Chloroform, Aether und absolutem Alcohol. 2) 0.65 Procent einer geruch- und geschmacklosen, festen Harzsäure; und 3) 2.0 Procent eines stark bitterschmeckenden Extractivstoffes.

Das Decoct der Rinde und des Holzes ist der allgemein gebräuchliche blutreinigende Thee des Landvolkes.

Das Holz ist etwas porös, von gelber Farbe, kaum bemerkbar braun geadert. Es wird vielfach zu Möbeln, auch zu Bauten benutzt, nur nicht wo es dem Einflusse der Witterung ausgesetzt ist. Sp. Gew. nach Dr. del Vechio 1.089.

Die Wurzelrinde ist ebenfalls von stark aromatischem Geruch und bitterem gewürzhaftem Geschmack. Die Infusion derselben wie auch die der Rinde der Aeste — 100 Grm. zu 1 Liter Colatur — wird kelchglasweise während des Tages eingenommen, sowie täglich ein Bad mit der Abkochung. Dies ist ein vielfach benutztes Volksmittel bei Rheumatismus.

and the formation of a black, brittle resin of savin-like odor. Picric acid dissolves quickly with dark yellow color and rosemary-like odor. With sulphuric acid the oil takes on a brick-red color, forming then a dark violet, resinous, soft mass. With nitric acid, the oil becomes dark green, the acid bright carmine-red.

With fuming nitric acid an explosive reaction takes place with a purple-red coloration. After three hours, very small, silvery, shining, needle-like crystals appeared at the surface. They are soluble in alcohol, spec. gr. 0.900, to but a slight degree, in alcohol of spec. grav. 0.860 they dissolve in all proportions.

20 kilos of fresh flowers yielded on distillation 1.950 gram of ethereal oil (0.009 percent). It is greenish, opalescent, thinly fluid, with an agreeable, somewhat jasmin-like odor. Spec. grav. at 15° C., 0.836.

From 20 kilos of the fresh, crushed bark 40 grams (0.2 percent) of ethereal oil were obtained. It is yellow, thickly fluid, of agreeable, somewhat myrtle-like odor and aromatic, camphoraceous, slightly bitter taste. Spec. grav. at 15° C. 0.973. When warmed with sulphuric acid, a strong, camphor-like odor is developed.

20 kilos of air-dried sawdust yielded 180 grams of a light brownish ethereal oil with an agreeable, somewhat fennel-like, sassafras odor and a sharp, spicy, slightly burning taste. Spec. grav. at 25° C. 1.055.

This oil is here in great repute as an embrocation for neuralgic pains and rheumatism, also as an effective antidote for serpent's bite. Every fifteen minutes 3 to 6 drops are taken with a tablespoonful of sugar brandy; cotton saturated with the oil is laid on the wound. The local tobacco manufacturers use the oil to increase the aroma and improve the taste of cigarette tobacco.

The air-dried sawdust loses 12 percent water and yields 1.55 percent ash. It contains: 1) 0.4 percent of a light yellow, soft resin of turpentine-like consistence, sharp, spicy taste and agreeable odor resembling a mixture of sassafras and terpinol. It burns with a bright flame without residue. It is soluble in benzol, chloroform, ether and absolute alcohol. 2) 0.65 percent of an odorless and tasteless, firm resin acid; and 3) 2.0 percent of a strong, bitter tasting extractive substance.

The decoction of the bark and the wood is the blood purifying tea in general use among the country inhabitants.

The wood is somewhat porous, of yellow color with scarcely noticeable brown grain. It is much used for furniture, also for buildings excepting only where it is exposed to the influence of the weather. Spec. grav. 1.089 according to Dr. del Vechio.

The root bark has likewise a strongly aromatic odor and bitter, spicy taste. The infusion of the same — as also of the bark from the branches — 100 grams to one liter of colature is given during the day by the wineglassful; also a bath is taken daily in the decoction. This folk remedy is very much employed in rheumatism.

Note on Phospho-Cereal.*

By Prof. *T. H. Norton.*

Among certain semi-remedial products now in use, I had occasion to examine one bearing the name of Phospho-Cereal, which is used to prepare a decoction not unlike coffee in its taste and appearance. The product is said to be obtained by parching the bran of various cereals. Its value is considered to lie in the amount of soluble phosphorus compounds present, and it appeals to those who prefer to use this element as a tonic in a vegetable rather than in a mineral form of combination. It seemed a matter of interest to ascertain just how much phosphorus is present in the commercial article, and how much can be extracted by simple decoction.

The total amount of phosphorus present was ascertained by ignition, solution in dilute nitric acid, and determination by the Handy method. It was calculated as P_2O_5.

2.0486 grams yielded P_2O_5 5.18 p. c.

In determining the soluble phosphorus, samples were boiled with 100 times their weight of water for varying lengths of time. The clear filtrate was used and the Handy method employed in all cases.

The following were the results:

	Weight used.	Decoction, minutes.	P_2O_5 %
I.	1.95 gr.	15	1.29
II.	2.00 "	30	1.43
III.	5.36 "	120	2.40

It is quite evident that ordinary decoction extracts but about one quarter of the phosphorus present; while even prolonged boiling extracts less than one half.

The application of the ordinary tests showed the absence of phosphites and hypophosphites in the aqueous extract, and that the phosphorus was present as phosphoric acid.

I am indebted to Mr. R. W. Hochstetter for carrying out the above phosphorus determinations.

Chemical Laboratory,
University of Cincinnati.

A Prescription-File and Check Blank.

By *Edward Kremers.*

Pharmacists have often complained of the fact, that many people who willingly pay a dollar or more to a physician for a consultation lasting but several minutes and a few written words in form of a prescription, are unwilling to pay half as much or even less for a prescription, the compounding of which requires skill and time, leaving out of consideration the cost of the material employed.

Those who at all peruse medical journals know that similar complaints are made by the members of this profession. Persons who were willing to be treated as charity patients sometimes find money to indulge in an unnecessary change of climate or the like.

It is difficult to fathom the human mind and heart. It might prove equally difficult to find a remedy after the disease had been properly diagnosed. If the pharmacist is a careful observer of himself and his calling it may be easier to find defects in his system which are more readily remedied than the peculiarities of the rest of mankind.

Even intelligent persons, who are able to read the average physician's prescription, sometimes fail to comprehend why they should pay what, considering the sale as a mere business transaction, they regard an enormous price for a simple solution. This feeling is aggravated if an assistant with but little education and training carelessly weighs the salt, thrusts it into the bottle, and fills the latter with water and shakes the contents. While conversing with the customer he licks the label, possibly pastes this over one already on the bottle and hands the medicine to the customer. This is not an exaggeration, but a daily occurrence in some drug stores.

The story is told of a druggist, who with prescription and medicine bottle in one hand walks along the shelves to fill the prescription. He grasps a tincture bottle. He puts it back with an excited air and informs the customer that he came near making a grave mistake and comments on the fatal effects that might have resulted had he not in time discovered his error. Fortunately this is not an every day occurrence.

As a rule prescriptions are compounded where the customer cannot witness the operation. The secrecy of the average prescription counter, however, is not such as to inspire confidence.

Careful pharmacists who have a large prescription trade with several prescription clerks make use of a system of checks by a second person that is too well known to be described here. Such a system is admirable when carried out conscientiously. However, it frequently becomes impossible in most pharmacies and even under the best conditions leaves no record of the check.

Only a few months ago a clerk got into serious trouble for having misread a poorly written and carelessly abbreviated prescription. It would appear from the reports that the physician was guilty of criminal negligence. On the other hand, it would seem that the clerk neglected to compute the dose and when brought into court was accused of having tampered with the prescription.

Errors in the compounding of prescriptions will, no doubt, always occur. It should be possible, however, to lessen the number of errors materially. Although the pharmacist as a rule is the one to suffer most, next to the unfortunate patient, the average pharmacist is inclined to consider strict precautionary methods as a waste of time and unrenumerative. Nevertheless, the writer ventures to make a few suggestions with regard to the filing and compounding of prescriptions, which ought

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*Read at the Springfield meeting of the American Chemical Society.

For............................*Age*..........

Received..........*189*...., *at*.....*M. By*..........

To be called for............................

No...........

Compounded by..........*Delivered by*..........*with*

the following remarks:—..........

..........*Price:*..........

(Paste in prescription and
number corresponding to
number on blank.)

UNABBREVIATED COPY.

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....

....

....

....

....

....

Number of doses in prescription.........			
Dose Prescribed.		Maximum Dose.	
Single.	Per diem.	Single.	Per diem.

Copied and computed by.......... ....*Checked by*..........
Licentiate. Assistant. Licentiate. Assistant.

Remarks on physicians prescription:—

Remarks on compounding of prescription:—

not only to result in greater accuracy and safety, but which may lend to the act that air of care and importance which will impress the customer with confidence.

There is nothing very remarkable about the suggestions. Possibly not one of them is new. In the combination to be suggested they have, however, found some favor with several practicing pharmacists to whom the plan was submitted for criticism. The accompanying blank is largely self-explanatory. The supposed advantages may be enumerated as follows: —

Immediately upon receipt, the physician's prescription is pasted on the left side of the blank and receives the number of the blank. Nothing more is done to the prescription as such, which remains untampered documentary evidence if necessary. If the prescription contains an incompatibility, the correction of which lies within the domain of the pharmacist, attention is called to such incompatibility, the mode of correction being also noted. Any changes in the prescription to enable it to be compounded *lege artis* should also be noted.

In order to guard against misreading, also as a check upon the dose, the prescription clerk makes an unabbreviated copy as documentary evidence of how he read the prescription. At the same time he computes the doses as indicated on the blank and compares these with the maximum doses, which are also recorded. For these he should not rely on his memory, but consult the tables, which might accompany each folio of blanks.

It would also be well to record any words of advise or precaution to be made when the medicine is handed to the patient or customer. The other features of the blank will, no doubt, explain themselves. Whenever possible, the ordinary system of checking should be carried out rigidly.

Such blanks may be bound in folios of 250 or 500 which, being numbered on the back, serve as files. If a prescription is to be refilled months or years after it has been written it can be found as readily as an article in a well classified and indexed library. With it there will be found all the detailed information desired.

In the courts it would impress both judge and jury with the painstaking care with which the prescription was compounded. In case of a mistake a poorly written and recklessly abbreviated prescription would contrast unfavorably with the unabbreviated copy by the pharmacist and would place the proper share of responsibility of error where it ofttimes largely belongs.

No doubt, much of this will seem to many pharmacists as a useless task and a waste of time. The writer by no means expects to witness its general introduction. Several pharmacists, however, have consented to give the blank a trial. When tried it may need modification or may be found too cumbersome.

However, it will possibly be admitted that it has at least some merit and that it may impress persons with the care and sense of responsibility with which prescriptions ought to be compounded. It has been suggested that the compulsory copy and the computation of doses alone would be an admirable training for apprentices and students who are largely initiated into the art of compounding prescriptions in a very reckless manner.

TRANSLATIONS.

Reagents and Reactions known by the Names of their Authors.*

Based on the original collection by *A. Schneider*, revised and enlarged by Dr. *Julius Altschul.*

Schlossberger's reagent for distinguishing textile fibres is a concentrated solution of freshly precipitated (still moist) nickelous hydroxide in ammonia. This solution dissolves silk, but neither wool nor cotton. Compare *Persoz's* reagent.

Schmidt's reagent for glucose is ammoniacal lead acetate solution, which causes a brownish-red precipitate upon warming with glucose solutions (diabetic urine). Cane sugar causes no reduction of the lead salt. Compare *Rubner's* reagent.

Schmidt's nitric acid reaction. Mix the solution to be tested with an equal volume of a solution of 20 drops aniline and 10 g. dilute sulphuric acid in 90 g. water, and pour this mixture in a layer upon concentrated sulphuric acid. If nitric acid was present, a light- to dark-red zone will appear.

Schmitt's test for saccharin in liquids. The strongly acidulated liquid is shaken out three times with a mixture of equal volumes of ether and petroleum ether, these extracts treated with caustic soda solution, evaporated to dryness, and the residue heated for half an hour to 250° C. The solid mass is then dissolved in water, acidulated with sulphuric acid and shaken out with ether. If saccharin was present it is found in the ethereal extract as salicylic acid, which after evaporation of the ether, can be identified by means of ferric chloride.

Schneider's arsenic test. Any arsenic that may be present in the suspected substance is separated as arsenous chloride by distillation with hydrochloric acid and ferric chloride, and is then identified by Marsh's test.

Schneider's test for potassium cyanate in potassium cyanide depends upon the formation of the sky-blue cobalt cyanate. From the highly concentrated potassium cyanide solution, the hydrocyanic acid is removed by means of carbonic acid, the potassium carbonate removed by the addition of alcohol, and the filtrate tested with cobalt acetate solution.

Schneider's test for foreign oils (from *Cruciferæ*) in olive oil. The oil is dissolved in 2 parts of ether, 5 ccs. of a saturated alcoholic silver nitrate solution added, and the mixture allowed to stand for twelve hours in a dark place. If any oils containing sulphur were present, the mixture will be darkened.

Schneider's reaction for bismuth. A solution of 3 parts tartaric acid and 1 part stannous chloride in a sufficient quantity of caustic potash solution gives a black precipitate with a solution of a bismuth salt.

Schoenbein's reaction for blood. See *Almén's* reagent.

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* Continued from p. 31.

Schoenbein's reaction for copper. A solution of a copper salt yields a blue coloration upon addition of potassium cyanide and tincture of guaiac.

Schoenbein's test-paper for ozone is filter paper saturated with potassium iodide starch-paste (10 p. starch, 200 p. water, 1 p. potassium iodide). This paper turns blue in an atmosphere containing ozone.

Schoenbein's reaction for hydrogen peroxide is identical with *Boettger's* reaction.

Schoenbein and **Pagenstecher's** reaction for hydrocyanic acid. Strips of filter-paper dipped into a 10 p. c. tincture of guaiac and dried, and subsequently moistened with 0.1 p. c. copper sulphate solution, turn blue in the presence of hydrocyanic acid. Compare *Payer's* test.

Schoenvogel's reaction for distinguishing animal from vegetable oils. Upon shaking with a concentrated borax solution, the latter, olive oil excepted, are said to form emulsions, while the former separate out sharply upon standing.

Schoenvogel's test for foreign fats in butter. 6 ccs. of a saturated borax solution and 5 drops of butter are shaken together at room temperature, or are warmed to the melting-point of the fat. Butter, beef-tallow, Provence oil, and mutton-tallow are said not to emulsify when so treated; all other fats do. Comp. *Levin*, Chem. Ztg., 1895, p. 1852.

Schott's white-lead paper = polka-paper. A sized paper, coated with white-lead, used as an external indicator in titrating solutions of metallic salts with sodium sulphide.

Schotten-Baumann's reagent is benzoyl chloride. See *Baumann's* reagent.

Schroeder's test for acetanilid in phenacetine. Boil 0.5 g. phenacetine with 6–8 ccs. of water, cool, filter out the crystallized phenacetine, boil the filtrate after addition of potassium nitrite and dilute nitric acid, add a few drops of *Plugge's* reagent and boil again. If acetanilid was present, a red color will appear.

Schuchardt's reagent for hydrochloric acid in the gastric juice is concentrated tropæolin solution.

Schultze's cellulose reagent. A solution of 25 p. anhydrous zinc chloride and 8 p. potassium iodide is made in 8.5 p. water, after which as much iodine is added as will dissolve upon slight warming. This reagent colors pure cellulose blue.

Schultze's furfurol reaction for albumens. Upon adding a trace of sugar to a solution of albumens in moderately concentrated sulphuric acid, and warming to 60° C., a beautiful bluish-red coloration appears. See *Raspail's* reaction.

Schultze's maceration liquid, for isolating the individual elements of plant tissues, is nitric acid to which some potassium chlorate has been added. The tissues are boiled for a few seconds in the mixture, whereby the middle lamella is dissolved, after which much water is added.

Schultze's alkaloidal reagent is phosphoantimonic acid. This is prepared by dropping antimonic chloride into aqueous phosphoric acid, or by mixing 4 parts of a saturated sodium phosphate solution with 1 part antimonic chloride. With solutions of alkaloids, this reagent, similar to the related phosphomolybdic and phosphotungstic acids (see *Jungmann's*, *Scheibler's*, *Sonnenschein's* and *De Vry's* reagent), yields mostly white precipitates.

Schulz's salicylic acid reagent. A neutral solution of a salicylate causes a green coloration with copper sulphate solution.

Schumpelitz's veratrine reagent is a solution of fused zinc chloride in dilute hydrochloric acid. Upon evaporating a few drops of this reagent to dryness with veratrine, a red color results.

Schuster's test for coloring matter in beer. Pure beer is said to be decolorized by tannin solutions, while the color produced by caramel is not destroyed under these conditions.

Schwarz's sulphonal reaction. Upon heating sulphonal with charcoal, the odor of mercaptan is developed.

Schwarzenbach-Delf's reagent is potassium platinic cyanide.

Schwarzenbach-Delf's alkaloid reaction. Upon treating with nitric acid and subsequently with ammonia, many alkaloids give characteristic color reactions.

Schweissinger's reagent for alkalies is a solution of equal parts of iodine and tannin in absolute alcohol. Even in very dilute aqueous solutions of alkalies (also carbonates), this reagent produces a red coloration.

Schweitzer's reagent for identifying soaps in lubricating oils is a saturated solution of metaphosphoric acid in absolute alcohol. In the presence of soap, the ethereal solution of the oil yields a white precipitate when treated with this reagent.

Schweizer's reagent for distinguishing textile fibres. Freshly precipitated, washed, and still moist cupric hydroxide or carbonate is shaken with ammonia water (20 p. c.) until a saturated solution results. This solution dissolves cotton, linen and silk, but not wool. The reagent is especially useful in microscopy, since it rapidly dissolves cellulose but has no action on lignin.

According to *Böttcher* this reagent can be prepared by allowing stronger ammonia water to again and again run in a thin stream over copper foil. *Wiesner* prepares it by allowing copper turnings to remain in contact with 13—16 p. c. ammonia water in an open bottle.

Seegen's test for grape sugar. See *Trommer's* test.

Seidel's reaction for inosite. The solution is evaporated to dryness with nitric acid and the residue treated with strontium acetate solution. Inosite causes a violet coloration.

Selmi's alkaloid reagent is prepared by diluting a saturated solution of iodic acid in concentrated sulphuric acid with 6 volumes sulphuric acid.

Another alkaloidal reagent proposed by *Selmi* is a solution of lead peroxide in concentrated hydrochloric acid.

Selmi's test for blood. The (blood-stained) object to be tested is extracted with ammonia, the filtrate precipitated with sodium tungstate and acetic acid, the precipitate after washing treated with a mixture of 1 vol. ammonia and 8 vol. absolute alcohol, filtered, the alcohol removed by evaporation, and the residue treated with sodium chloride and acetic acid. If blood was present, hæmin crystals can be found upon microscopical examination.

Silbermann's reaction for albumen. Albumen freed from fats gives a violet coloration upon heating with fuming hydrochloric acid.

Skraup's reaction for thallin. This substance yields an emerald green color when treated with oxidizing agents as chromic acid, bromine, iodine, mercuric nitrate, or ferric chloride.

Smith's modification of *Maréchal's* test (q. v.) for biliary pigments. Pour tincture of iodine carefully upon the suspected urine so that a zone reaction may be observed.

Snow's mixture for shaking out colchicine consists of 18 ccs. chloroform, 2 ccs. alcohol, 80 ccs. petroleum ether and 10—15 drops of ammonia water.

Soldaini's solution for identifying glucose. 15 g. cupric carbonate are dissolved in 1400 g. water with the aid of 416 g. potassium bicarbonate. Upon boiling this solution with solutions of glucose, cuprous oxide separates out. Compare *Ost's* copper solution.

Sonnenschein's reagents for alkaloids.

I. Cerous hydroxide is suspended in caustic potash solution and chlorine gas passed into the mixture until the formation of the brownish-yellow ceric hydroxide is completed, after which it is collected, washed, and dried. The alkaloid is dissolved in concentrated sulphuric acid and a trace of ceric hydroxide is added. Concerning the resulting color reactions, see *Hager*, Pharm. Praxis I, 207.

II. (Phosphomolybdic acid.) A solution of ammonium molybdate in nitric acid is precipitated with phosphoric acid, the precipitate washed, boiled with nitro-hydrochloric acid to decompose the ammonia, evaporated to dryness, and the residue dissolved in 10 p. c. nitric acid. This reagent yields yellow precipitates with weakly acid solutions of alkaloidal salts (also with ammonia and some other bases).

Compare *Jungmann's* reaction.

Souchère's test for peanut oil. The free fatty acids separated from the suspected oil are dissolved in boiling alcohol. If peanut oil was present, arachic acid separates out upon cooling in characteristic shining crystals.

Spicea's test for salicylic acid (in wine). The wine is extracted with ether; the residue left upon evaporation of the ether is warmed with concentrated nitric acid, then ammonia added in excess. If salicylic acid was present, it is hereby converted into picric acid, which can readily be identified by the yellow color which a woolen fibre assumes when dipped into the solution.

Spiegler's reagent for albumen consists of 8 g. mercuric chloride, 4 g. tartaric acid, 200 g. water and 20 g. glycerin. The suspected urine is acidulated with acetic acid, any resulting precipitate (mucin) filtered out, and the reagent poured in a layer upon the filtrate. In the presence of albumen, a white zone will appear. If the urine contained iodine, there would be found at the line of contact a yellow flocculent precipitate, soluble in alcohol.

The delicacy of *Spiegler's* test depends upon the amount of chlorides in the urine. *Rafaële* therefore proposed to use hydrochloric instead of acetic acid. A reagent which is independent of the chloride content is *Jolle's* reagent (q. v.).

Stahl's reagent paper is filter paper saturated with a 1—5 p. c. cobaltous chloride solution. When dry, it is blue, in moist air it assumes a reddish color, and can therefore be used in hygroscopic determinations. Compare *Merget's* test.

Stas-Otto's extraction test for distinguishing alkaloids. The alkaloids are divided into three groups depending upon their property 1, of being taken up by ether from acid solutions; 2, of being taken up by ether from alkaline solutions; 3, of not being taken up by ether under either condition (morphine).

Stenhouse's caffeine reaction. Upon heating caffeine for a few minutes with fuming nitric acid, evaporating the yellow solution to dryness, and moistening the residue with ammonia water, a purple color results similar to that of murexid, but which disappears upon the addition of caustic potash (while the murexid color is thereby changed to blue).

Storch's test for rosin oil in oil mixtures. 1—2 ccs. of the oil are shaken with 1 cc. acetic anhydride, allowed to stand, the acetic anhydride separated by means of a pipette and treated with a drop of concentrated sulphuric acid. In the presence of rosin oil a violet-red color appears. *Morawski* recommends sulphuric acid of sp. gr. 1.53 instead of the concentrated acid.

Strassburg's reaction. See *Pettenkofer's* reaction.

Struve's test for blood. Suspected stains are extracted with dilute caustic potash solution, the solution filtered and tannin added. If blood was present, the solution is colored reddish-brown, and upon acidulating with acetic acid yields a precipitate which, after washing and treating with acetic acid and sodium chloride, yields hæmin crystals. (See *Selmi's* test and *Teichmann's* hæmin crystals.) Urine containing blood yields a reddish precipitate upon addition of caustic soda and tannin, and subsequent acidulating with acetic acid.

Stuetz's albumen-reagent capsules contain *Fürbringer's* reagent (q. v.).

Tanret's reagent for albumen. 3.32 g. potassium iodide and 1.35 g. mercuric chloride are dissolved in 20 ccs. acetic acid and diluted with water to 60 ccs. With albuminous urine this reagent yields a white precipitate, insoluble in acetic acid. Peptones cause precipitates which redissolve upon boiling; alkaloids, precipitates soluble in alcohol. Compare *Mayer's* reagent.

Tattersal's morphine reaction. Upon addition of sodium arsenate to a solution of morphine in concentrated sulphuric acid, a dirty violet color results which changes to sea-green.

Codeine yields a blue color when so treated.

Teichmann's hæmin crystals as a test for blood. Treat 2—3 ccs. of an aqueous, not too dilute, solution of blood with a few drops of glacial acetic acid and a trace (0.01 g.) of sodium chloride. A few drops of the solution are evaporated on a cover-glass and the residue examined microscopically. The hæmin crystals are rhombic needles or plates of brownish-red to dark brown color.

For applications see *Struve's* and *Selmi's* test.

Thénard's test for aluminium compounds. Aluminium oxide (separated from compounds by igniting on charcoal, with the addition of sodium carbonates if necessary) yields *Thénard's* blue upon igniting with cobalt salts.

Thoulet's liquid is made by dissolving 1 part potassium iodide and 1.239 parts mercuric iodide in water and evaporating this until a pellicle commences to form. The solution then has a specific gravity of 3.196 and is used for the mechanical separation of the constituents of powdered minerals. Compare *Klein's* liquid.

Thresh's reagent for alkaloids is a solution of 1.8 g. potassium iodide in 45 ccs. hydrochloric acid and 30 ccs. of a bismuth solution (Liq. Bism. et Amm. Citr., Brit. Ph.) prepared as follows: 2.5 g. bismuth are dissolved in 70 g. nitric acid, 60 g. of nitric acid are added, then enough ammonia to render weakly alkaline, and enough water to make 600 ccs.

This reagent causes reddish-brown colorations and precipitates with alkaloids.

Tocher's modification of *Baudouin's* reaction for benne oil. 2 g. of pyrogallol are dissolved in 30 ccs. hydrochloric acid (sp. gr. 1.19?), and 15 g. of this solution shaken with an equal volume of oil. After standing and allowing two layers to form, the acid solution is removed by means of a pipette and warmed for five minutes. In the presence of benne oil, a blueish-red color appears.

Tollen's reagent for glucose is an ammoniacal silver solution, obtained by precipitating silver nitrate solution with caustic potash and adding enough ammonia to just dissolve the precipitate formed. This solution is reduced by glucose.

Tommasi's phenol reaction. See *Hoppe-Seyler's* reaction.

Topping's solution is used for imbedding microscopical preparations. It consists of a mixture of 1 p. absolute alcohol and 5 p. water, or in place of the latter, 4 p. water and 1 p. aluminum acetate. The solution is mixed with an equal volume of glycerin before using.

Traub's reagent for hydrogen peroxide is a zinc iodide-starch solution to which copper sulphate and some ferrous salt have been added.

Trapp's veratrine reaction. Upon boiling with concentrated hydrochloric acid, veratrine yields a permanent purple color.

Trommer's test for glucose. Upon adding 1—2 drops of copper sulphate solution and 4—5 ccs. of caustic soda solution to a dilute solution of grape sugar, the precipitate will dissolve and upon heating cuprous oxide separates out. Compare *Fehling's* solution.

For examining urine, this is rendered alkaline with soda lye, then cupric sulphate solution added drop by drop until a permanent precipitate appears. If glucose was present, the yellow cuprous oxide will form upon heating.

To remove other reducing agents that might be present, 10 ccs. of urine are boiled with 5 ccs. copper sulphate solution (1:10), 2 ccs. sodium carbonate solution (1:10) added to the cooled filtrate, the solution filtered after standing, and the filtrate tested according to *Trommer's* test. Compare *Johnson's* reaction.

Trotarelli's reaction for ptomaines. Upon adding sodium nitroferricyanide and subsequently palladium nitrate to the sulphuric acid salts of ptomaines, characteristic color reactions appear. Compare *Vitali*.

Trotarelli's alkaloid reaction. Upon evaporating with concentrated nitric acid and subsequently treating the residue with alcoholic potash solution, various alkaloids give characteristic color reactions. Compare *Vitali*.

Tscheppe's alcohol reaction. 70 p. c. nitric acid is poured in a layer upon the liquid to be tested. If alcohol was present, a green color will appear at the line of contact; after some time bubbles of gas will form and the odor of ethyl nitrite become apparent.

Tuchen's reaction for ethereal oils. Many ethereal oils fulminate when 4—6 drops of the oil are brought in contact with 0.1 g. iodine.

Udransky-Baumann's test for poly-acid alcohols (glycerin, carbohydrates) depends upon *Baumann's* reaction with benzoyl chloride and sodium hydroxide. Since diamines also give this reaction, the presence of the first mentioned compounds must be confirmed by means of the furfurol reaction. See *Molisch's* reaction.

Uffelmann's reagent is a mixture of 1 drop ferric chloride solution, 0.4 g. alcohol, and 100 g. water. This reagent is decolorized by hydrochloric acid; lactic acid colors it yellow, butyric acid causes a milky turbidity.

Ultzmann's test for biliary coloring matter. 10 ccs. urine are shaken with 3—4 ccs. potassium hydroxide solution (1:3) and an excess of pure hydrochloric acid added. In the presence of biliary pigments the mixture assumes a beautiful emerald-green color.

Valenta's test for fats. Equal volumes of fat and glacial acetic acid (sp. gr. 1.0562) are intimately mixed in a test tube; if the oil does not dissolve in the cold, apply heat. 3 classes of oils are distinguished, depending upon whether solution results at ordinary temperatures, at temperatures up to the boiling point of glacial acetic acid, or whether even then, solution is incomplete. Further, in the case of oils dissolving upon application of heat, the temperature is observed at which, upon cooling, turbidity first appears.

According to *Bach*, the same observations made with *David's* alcohol acetic acid (q. v.) and the free fatty acids separated from the fats, give good results.

Valentine's reaction for fuchsin. Upon shaking ether with a solution containing fuchsin, the ether does not dissolve the coloring matter, but upon adding ferrous iodide, the ether is colored violet.

Valser's reagent is potassium mercuric iodide.

Van Deen's test for blood. Upon adding a few drops of freshly prepared tincture of guaiac resin and a little ozonized oil of turpentine to a highly diluted solution containing blood, a blue color results.

Vetere's test for castor oil. See *Di Vetere*.

Villavecchia and **Fabri's** modification of *Baudouin's* test for benne oil. Reagent: 2 g. furfurol in 100 ccs. alcohol.—10 ccs. oil are shaken for ½ minute with 0.1 cc. furfurol solution and 10 ccs. hydrochloric acid (sp. gr. 1.19). A red coloration indicates benne oil.

Villier and **Tayolle's** reagent for hydrochloric acid and chlorine. Even traces of chlorine cause in acid aniline solution (400 ccs. saturated aqueous aniline solution, 100 ccs. glacial acetic acid) brownish to black precipitates; with aniline solutions containing ortho-toluidin (100 ccs. saturated aqueous aniline solution, 200 ccs. saturated aqueous ortho-toluidine solution, 30 ccs. glacial acetic acid), a blue coloration results. Bromine and iodine cause no color reactions with above mixtures, although bromine yields white precipitates. To apply this test to the halogen hydracids, the halogens are liberated from their combinations by heating with dilute sulphuric acid and potassium permanganate.

Violette's solution for testing for glucose is identical with *Fehling's* solution (q. v.).

(To be continued.)

MONTHLY REVIEW.

Chemistry.

Piperidine Guaiacolate.

This compound, $C_5H_{11}NC_7H_8O_2$, has been prepared by Schidrowitz by the action of piperidine on guaiacol dissolved in benzene or petroleum ether. It crystallizes in prismatic needles or plates, melts at 79.8° C., is soluble in water to the extent of 3.5 p. c., and also easily soluble in most organic solvents. Mineral acids and alkalies decompose it into its constituents. It has been used in the treatment of phthisis by Chaplin and Tunnicliffe, who suggest that its pharmacology resolves itself into that of guaiacol and piperidine, as the compound is decomposed into those substances, probably in the alkaline medium of the duodenum. The solubility of the guaiacolate is remarkable when contrasted with that of guaiacol carbonate. Thus, ten grains can be administered in an ounce of water or, if a little glycerin or mucilage be added, as much as thirty grains can be conveniently given at once.

[Pharm. Journ. 58, p. 82; Br. Med. Journ. No. 1881, p. 136.]

Reduction by Calcium Carbide.

The use of calcium carbide as a metallurgical reducing agent is described by H. N. Warren. An excess of litharge being heated to redness with the carbide, metallic lead and calcium oxide result, the reaction being accompanied by a vivid incandescence. When the carbide is in excess, carbon dioxide is evolved, and a regulus of calcium and lead obtained, of varying percentage according to the temperature employed. The alloys thus formed are more or less brittle and to a certain extent sonorous when struck. Their melting points rank below that of pure lead, and they are slowly but completely decomposed in contact with aqueous vapor, the reaction being much less energetic than that afforded by alloys of lead with the alkali metals. Stannic, cupric and ferric oxides are readily reduced by the carbide, but yield results of no practical value, whilst manganese, nickel, cobalt, chromium, molybdenum and tungsten oxides yield calcium alloys on reduction.

[Pharm. Journ. 58, p. 81; from Chem. News 72, 2.]

On the Active Principle of Frangula Bark.

As active principle of frangula bark Kubly isolated a glucoside which he termed frangulic acid. This fact was also examined pharmacologically and verified. Kubly prepared his acid by precipitating the aqueous extract, evaporated in vacuum, with absolute alcohol. The product thus obtained was amorphous and contained as much as six percent of calcium and magnesium salts.

Since then frangulic acid has not been reexamined. Besides the acid frangulin has been isolated from the bark (0.07%) and examined particularly by Schwabe. Frangulin is a glucoside and splits up into rhamnodulcite and trioxymethylanthraquinone (emolin).

E. Arveng has recently examined Kubly's frangulic acid. Upon hydrolysis with 5 p. c. aqueous hydrochloric acid (10 minutes) it breaks up into: 1) a sugar which reduces Fehling's solution in the cold, does not ferment, is not sweet, turns the plane of polarized light to the right and condenses to a yellow crystalline product with phenylhydrazine; 2) a reddish-brown powder, sparingly soluble in water, but soluble in the ordinary organic solvents. This latter compound is possibly the pure frangulic acid of Kubly. Whether it is identical with frangulic has not yet been determined. It is also a glucoside and can be hydrolized by boiling the alcoholic solution with hydrochloric acid. A sugar and a substance insoluble in water result. The latter sublimes with partial decomposition in the form of orange needles. This substance like the second glucoside dissolves in alkalies with cherry-red color. The identity of this substance with emodin is suspected, but still an open question. It is suggested that the second glucoside, which like the first possesses cathartic properties, may prove useful for assay purposes.

[Journ. d. Pharm. f. Elsass-Lothringen, 24, p. 1.]

Botany and Pharmacognosy.

Adulteration of Pimento.

Mr. C. A. Macpherson reports finding commercial pimento of a reddish color differing from that usually seen. Closer examination showed a dull, earthy appearance. The coloring matter, insoluble in water, was removed by washing. An analysis of the chemical so obtained proved it to be ferric oxide.

[Chemist and Druggist, 50, p. 117.]

Testing Muskpods by Means of X Rays.

In a recent number of the *Pharm. Centrh.*, Dr. Wolff demonstrated the efficiency of the Roentgen rays to detect metallic adulterations in muskpods. Bits of such materials gave distinct black spots in the resulting "picture." The *Chemist* and *Druggist*, however, calls attention to the fact that paper, blood clots and such impurities cannot be detected by this process.

[Chemist and Druggist, 50, p. 129.]

Manna in Australia.

Messrs. R. T. Baker and H. G. Smith state that true manna is found in Queensland on what is known as "bluegrass," *Andropogon annulatus*. The substance is found on the nodes of the stem in masses as large as marbles. This, it seems, is the first time that a substance of this character has ever been detected on a grass. The grass is indigenous not only in Australia, but also in tropical Asia and Africa. The manna is sweet and contains nearly 75 percent of mannite. Besides the mannite, the manna contains a peculiar ferment, which seemingly has the power to decompose cane sugar without the evolution of carbonic acid or gases of any kind. It probably belongs to the *Saccharomycetes* and is allied to the ferments of which the yeast plant is a type.

[Chemist and Druggist, 50, p. 260.]

Saffron.

Saffron from Eastern countries will be regarded with disfavour if a report appearing in the Daily News should be confirmed. According to the Vienna correspondent of that paper, the Sanitary Council of Con stantinople has resolved, on account of the plague, to prohibit pilgrimage from India and Persia to Kherbela, a favorite place of burial with the Shiïtes and other Indian sects. It is said to be the custom for the bodies of wealthy Shiïtes to be laid aside until a caravan leaves for Kherbela, and, the report proceeds, "the dead are sown up in carpets with large quantities of saffron to preserve them. At Kherbela the bodies are buried, and carpets and saffron are sold to European dealers." "Saffron may not be any the worse for this treatment, but most people would prefer it in its virgin freshness" is the opinion of an Englishman.

[Pharm. Journ., 1897^{I}, p. 112.]

Eucalyptus rostrata and its Kino.

In a recent article on this subject by J. H. Maiden, many interesting facts are brought out. The protean genus *Eucalyptus* contains a large number of species which differ among themselves in, among other things, their barks. Some have rugged, dense, hard barks, known as "iron barks." Others have very fibrous barks which strip off in long pieces or even sheets used for roofing in parts of Australia, called "stringy barks." Others have wooly, matted barks and are known as "box." All these belong to the rough-barked varieties. Others have smooth barks and go by the name of "gums" or "gum trees." The rough-barked species produce gum (kino) as abundantly or even more so than the smooth-barked kinds, but the stain of the gum on the latter is more apparent. Perhaps for this reason the term "gum" in common parlance has become to be applied exclusively to the smooth-barked forms.

The kino is procured in the following manner: The men employed in collecting it look for the trees from which the substance is or has recently been exuding, and cut into the tree till they get beyond the gum-yielding tissues. A trough-shaped piece of tin is then inserted into the hole and the kino flows into a receptacle provided for the purpose. When the kino exudes, it is of the consistency of molasses and has a sourish odor. In a few days it dries into a solid mass which subsequently becomes quite friable. It is owing to this property that this kino, as well as other kinds of the "turbid" group, cannot be collected in a hardened condition by simply picking from the bark. As much as four gallons have been procured from one tree, but this is exceptional. On an average, not more than one quart per tree is obtained, and from a majority of the trees no appreciable quantity is obtained by tapping. The usual price paid on the Murray River, Australia, at the present time for liquid kino is 7 d. per pound. A good workman can procure between ten and twelve pounds per day of the liquid kino. It loses but little weight in drying. [Am. Journ. Pharm. 69, p. 1.]

Mastic.

It is well known that the bulk of the mastic of commerce is supplied us by the small island of Scio (Chios) and that it is the product of *Pistasia Lentiscus.* The male bushes yield by far the largest quantity of resin. An allied species, *P. Terebinthus*, also growing in Scio, yields another well known product, Chian turpentine. This bush or small tree also grows in Cyprus, and, it is said, furnishes a considerable quantity of mastic all of which is used locally for chewing and as a drug. It is multiplied by suckers and layers and is planted at distances between to allow a circulation of air amongst the plants for the purpose of drying the resinous exudation which occurs either spontaneously or by pricking the stems. The principal labor in the cultivation of the shrub is said to be the pruning and picking of the plant, which is done from the middle of July to the end of September. By the system of pruning adopted, the shrub is converted into the shape of a small tree with sparse, spreading branches, so that the resin may be gathered conveniently and the ground beneath kept clear. The wounding of the stem and the principal branches is done with a tool of the shape of a small chisel. From the wounds the resin exudes in the form of small tears, which in a few days become dry. This is gathered by being detached from the stem and branches by another tool also resembling a small chisel, but bearing at the end a round plate of about half an inch in diameter, serving as a scraper. The gum gathered direct from the shrub in a condition resembling pear shaped grains, is mastic of the first quality, whilst that dropping on the ground as well as that accumulated on the stem and branches in lumps, being more or less mixed with earth, bark and other foreign matter, forms mastic of the second or third qualities. Though mastic is, for trade purposes, produced almost exclusively in Scio, there seems to be no reason why it should not be readily obtained from other islands of the Greek Archipelago. The exports from Scio go chiefly to Constantinople and other parts of Turkey as well as to Trieste, Marseilles and Vienna and, in smaller quantities, to England. The yield per tree is very small, averaging, it is said, not more than 8 to 10 pounds per annum.

[Chemist & Druggist, 50, p. 273.]

Practical Pharmacy.

Extemporaneous Chlorine Water.

Chlorine water can be extemporized by the action of sulphuric acid on sodium chloride in the presence of minium or litharge with the requisite amount of water. The reaction is expressed by the following equation: $3H_2SO_4+2NaCl+Pb_2O_3=2PbSO_4+Na_2SO_4+3H_2O+2Cl$. Inasmuch as such a preparation contains sodium sulphate Griggi suggests the use of oxalic acid in place of sulphuric acid, and of calcium chloride for sodium chloride. The resulting calcium and lead oxalates are insoluble. $2C_2H_2O_4+PbO_2+CaCl_2=C_2O_4Ca+C_2O_4Pb+2H_2O+2Cl$.

[Pharm. Wochensch., 14, p. 87; from Bollet. chimic farmaceut., 1896.]

Assay of Tincture of Strophanthus.

For the assay of strophanthus preparations, whose strength is liable to vary greatly on account of the great differences in the crude drug, J. Barclay has recently recommended an indirect method, after numerous attempts to secure a direct method for the estimation of strophanthin had failed. Barclay made use of the fact that strophanthin by hydrolysis is easily converted into the chloroform-soluble strophanthidin, 36.5 p. of which correspond to 100 p. strophanthin. The method of procedure is as follows: 50 ccs. of the tincture are mixed with a like volume of water and the alcohol is removed by evaporation on the water-bath. The remaining aqueous solution is filtered, shaken with chloroform, and then digested for an hour with dilute sulphuric acid on the water-bath. The liquid will become turbid owing to the formation of a flaky precipitate, which after cooling is dissolved by shaking three times with small portions of chloroform. The chloroformic solutions are mixed, the chloroform removed by distillation, the residue dried at 65° C. and the weight divided by 0.365 to give the amount of strophanthin in 50 ccs. of the tincture.

[Pharm. Journal, 1896, p. 1379; Pharm. Zeitung, 41, p. 880.]

Morphine as an Andidote in Potassium Cyanide Poisoning.

Dr. L. Heim reported in the Münch. med. Wochenschrift as follows:

A dog, which was to be killed, was given an hypodermic injection of 0.4 g. morphine, and an hour later, to hasten death, a lethal dose of potassium cyanide. Contrary to expectation, not only did the symptoms of morphine poisoning decrease, but also the effects of the cyanide did not become noticeable for a considerable time; death did not occur until two hours after the administration of the potassium cyanide. This observation, in which potassium cyanide seemed to act as an antidote to morphine, led the author to investigate whether conversely, by the subcutaneous injection of morphine in non-fatal doses, a fatal dose of potassium cyanide could not be rendered harmless.

Experiments on mice proved beyond doubt that by the prompt injection of morphine these animals could be saved from an otherwise sure death from potassium cyanide poisoning, or at least, in most cases, death could be greatly delayed. Of ten mice so treated, six were saved, three died within three hours, and only one succumbed as rapidly as the control animals, all of which died within ½ hour.

The author believes that this favorable action is due to the fact that potassium cyanide and morphine in the presence of iron of the blood form oxydimorphine and Prussian blue, both of which are comparatively harmless.

[Münch. med. Wochenschrift, 1896, No. 37; Therap. Monatsh., 10, 576.]

Agar Suppositories.

Prof. L. Lewin and Dr. Eschbaum have recently studied the methods of preparation and the action of various suppositories, and published their results in the D. Med. Wochenschrift, 1897, No. 2.

The requirements which a suppository should fulfill are, according to Prof. Lewin, as follows: The medicament should be uniformly distributed throughout the mass and should free itself easily and rapidly from the vehicle. The suppository should be sterile, or nearly so, should be easy of introduction, and should contain an exact dose of the incorporated medicament.

Experiments with cacao butter as a base showed that a uniform distribution of the medicament as well as an accurate dosage of the same could only be accomplished by rubbing up the ingredients with the fat, and subsequently rolling the mass into cylinders and dividing on a pill tile. The method of casting suppositories in moulds, except where the medicament was soluble in the fat, never yielded an exact dosage nor uniform distribution throughout the suppository, as was proved by actual analysis. The use of suppository shells should of course, for the latter reason, never be practiced.

Glycerin-gelatin suppositories, according to the authors, are preferable to cacao-butter suppositories in every respect. Not only can an exact dosage be more readily attained with the former, but the suppositories can also be introduced with less difficulty, and the medicament is more easily resorbed than is the case with the latter. The objections however to these suppositories are that they are generally not sterile, that the gelatin employed often contains basic and other products that might be injurious to the human organism, and that the glycerin they contain might cause a local irritation of the intestines.

On this account, Lewin and Eschbaum recommend the use of agar as a suppository base. Upon heating 1 p. of commercial finely powdered agar for a few minutes on the water-bath with 20 p. of water, a mass results which can easily be poured, but which upon cooling forms a slippery, elastic, tough resistant mass.

Agar has an acid reaction; in the manufacture of the agar-gelatin it is neutralized by the addition of 0.1 g. of sodium carbonate to 10 g. of the powdered agar. The directions for the preparation of agar-suppositories are given as follows: One part of neutralized agar is placed in a small prescription bottle together with the required quantity of the (water-soluble) medicament, 29 p. of water added, the mixture shaken, the cork tied firmly to the neck of the bottle and the bottle placed for 5—10 minutes in boiling water. Pieces of paraffin-paper, about 4 ccm. square and rolled to form hollow cones are best employed as moulds. These can be placed in a light wooden frame upon a suitable balance and the required quantity of the hot agar mass poured into each. The suppositories are kept in the paper moulds until required for use.

Some medicaments, as mercurial ointment and bismuth subnitrate cannot be formed into suppositories by the above method, but must be rubbed up with the agar mass. Antipyrine requires a larger proportion of agar than indicated in the general formula, a mass of 10% antipyrine requiring twice, one of 50%, three times the above quantity. Tannin suppositories are prepared without the application of heat. 1. p. tannin and 2 p. powdered agar are mixed and kneaded with 7 p. of water; the mass is then rolled into cylinders and divided into required number of parts. Almost all medicaments can readily be incorporated with the agar mass to form homogeneous mixtures. Vaginal suppositories and bougies can also be prepared with an agar mass by employing suitable moulds. For the former, a wooden block with cavities of the desired shape and size is very convenient; the cavities are lined with parchment or wax paper, pressed into them by means of a suitable plunger.

New Remedies.

(Continued from p. 37.)

Euquinine or Euchinin is quinine carbonic acid ethyl ester. According to C. O. Noorden (Pharm. Ztg., 1896, p. 857; from Pharm. Post, 29, p. 564; from Ctrlbl. f. inn. Med.) it was introduced by the Frankfurter vereinigte Chininfabriken. When, none of the abstracts mention; presumably in 1896.

Ethylene diamine kresol, or rather ethylene diaminetrikresol, is a product made by the Chem. Fabrik auf Actien, formerly E. Schering, in the attempt to prepare antiseptics that will not coagulate albumen. The Pharm. Centrh. for 1894, p. 180 and 305 reports on the chemical experiments. According to Pharm. Ztg., 1896, p. 695 Baer reported at the Frankfurt (1896) session of the Society of German Scientists and Physicians on the clinical tests made by Schaefer during the course of a year. Although the compound was introduced chemically in 1894, its therapeutic introduction was made in 1896.

Formaldehyde caseïn. A condensation product of caseïn and formic aldehyde, introduced by Merck. The first clinical reports appear to have been made by Dr. E. Bohl in No. 38 of the Muench. Med. Wochensch. It is said to have properties similar to glutol, obtained by the action of formic aldehyde on gelatin. See also Merck's Market Report, 5, p. 570.

Formopyrine. E. Marcourt described in the Bulletin of 1896 this substance as a new compound obtained by the action of formic aldehyde on antipyrine. F. Stolz, however, showed in the Berichte for the same year, p. 1826, that this compound had been discovered twice previously and refers to Pellizzari (Gazz. chim. it., 19, p. 413; Ann. d. Chem., 225, p. 246,) and to Schuftan (Ber. 28, p. 1180). The name alone, therefore, is new.

Galactochloral. A compound similar to xylochloral and chloralose, obtained by Hauriot (C. r. 1896, June 18.) by heating galactose and chloral in the presence of hydrochloric acid.

Glutoform. An antiseptic prepared from formic aldehyde and gelatin by the chemical factory Rhenania, which is said to be quite distinct from glutol or formaldehyde gelatin (also formalin gelatin). It was introduced in 1896.

Glutol. The fact that formaldehyde hardens gelatine has been known for some time. Although the compound does not appear to act antiseptically in cultures, Schleich (Therapeutische Monatshefte, 10, p. 27) has observed that it acts as an antiseptic on wounds. A lively controversy has arisen as to chemical nature and therapeutic effect. The arguments are presented principally in a number of communications to the Therap. Monatsh. for 1896. A partial summary can be found in the Pharm. Centrh., 37, p. 483. Schleich's first communication was sent in Dec. 1895 but published in Jan. 1896. Schleich's formalin gelatin is prepared by the apothecary Kohlmeyer of Berlin. The use of gelatin hardened by formaldehyde for capsules to be resorbed by the small intestines is discussed by Weyland on p. 180 of the Th. Monatsh. for 1896. Compare also Proc. A. Ph. A., 44, p. 486.

Guaethol, pyrocatechinethylether, corresponding to guaiacol, the methyl ether of pyrocatechin, which it is to replace on account of more satisfactory action. This at least is the opinion of Prof. v. Mering. It is prepared by Merck and not to be confounded with the ethylene ether, guajacolum aethylenatum, $CH_3O.C_6H_4O{-}C_2H_4{-}O.C_6H_4OCH_3$, of the same manufacturer. (Comp. Merck's Ber. für 1895). According to Kremel (Pharm. Post, 29, p. 582), ethyl ether of guaiacol is termed ajacol by the chemical manufacturer Dr. Heyden, and thanatol by Dr. Ilosvay in honor of Prof. Than.

Guaiacolum aethylenatum. See also under guaethol. This compound was patented March 17, 1894. It was examined therapeutically by Dr. v. Oefele, evidently in 1895. Merck includes it in his report for that year.

Guaiacetin. Pyrocatechin monocarbonic acid $C_6H_4(OH)O.CH_2.COOH$, is obtained by introducing a carboxyl group into the methyl group of guaiacol. A clinical report was made by Strauss in the Centralbl. f. inn. Med., 1896, Nr. 25.

Guaiacol valerianate or "Guaiacolum valerianicum." According to Pharm. Ztg., 1896, p. 497, this substance has been introduced by the apothecary Lehmann of Berlin. Like Kreosotum valerianicum it is to be used against tuberculosis. Information with regard to this substance appears to be scant. The trade mark name is "geosot."

Hæmolum bromatum. This compound is mentioned by Merck in his report for the year 1894. Clinical examinations are reported as being in progress but not completed. Clinical reports were made by Holst in 1896, (Pharm. Centrh., 37, p. 621; from Deutsche Med. Ztg., 1896, 592).

Imidiod. References in pharmaceutical journals evidently can be traced back to Merck's Market Report for 1896, p. 454. Since this journal in this instance, like several others, does not mention the source of its information, the matter was not traced farther. This new antiseptic is said to be obtained by heating p-ethoxysuccinimide, potassium iodide, and iodine in diluted acetic acid. It is described as lustrous, rhombic crystals that melt at 175°. From the description it appears not to be what its name purports, and evidently should not be confounded with iodoimide I_2NH.

Iodoformine or hexa methylene tetramine iodoform seems to have been first prepared by A. Eichengruen and introduced by L. C. Marquart of Bonn. It is mentioned in both the Pharm. Ztg. and the Pharm. Centrh. for 1895.

Iodosinum. Compare bromosinum. This is the corresponding iodine derivative guaranteed to contain 15 p. c. iodine.

Itrol, silver citrate was reported on by Credé together with Atrol, q. v., in Jan. 1896.

Kosotoxin. This substance, $C_{26}H_{34}O_{10}$, which is stated to be the physiologically active principle of the koso flowers, was isolated by Leichsenring in 1893 (Arch. f. Pharm. 232, p. 50). It was examined by M. Handmann in the Pharmacological Institute of Leipzig, according to whom it has a strong poisonous action on the muscles, but little effect upon the central nervous system. This report (source of information not given), which seems to have been made in 1895 or very early in 1896, evidently caused the enumeration of the compound among the new remedies introduced last year.

Kreosotem valerianate or "Kreosotum valerianicum." The valerianic ester of creosote was prepared by G. Wendt and examined therapeutically by E. Grawitz. It is manufactured and sold under the trade mark name "eosot" by the apothecary Lehmann of Berlin. It is said to be neither irritating nor poisonous and is used in tuberculosis. (Therap. Monatsh., 1896, p. 384).

Lactyltropeïne, a condensation product of lactic acid and tropine. It was not introduced in 1896, but earlier. (Pharm. Centrh. 37, p. 73; 36, 261; and 35, p. 614.)

Lentamine. According to Zimmer & Co's Report (Frankfurt a. M.) this is an alkaloid from *Lentana brasiliensis.* Bueza and Negreta are said to recommend it highly as an antiseptic. No further references are given in the Pharm. Ztg., 1896, p. 90, and from the little information contained in the note, its date of introduction would seem to precede the year 1896.

Levulochloral. Compare galactochloral. A compound ($C_8H_{11}Cl_3O_6$) likewise prepared by Hanriot. It melts at 228°, is readily soluble in water and alcohol, more sparingly in ether.

Lithio-piperazine. This compound of lithium and peperazine was introduced by L. C. Marquart of Beuel, evidently in 1896. It is readily soluble in water, is even hygroscopic and is supposed to combine the solvent power of piperazine for urea and the diuretic effect of lithium. (Pharm. Ztg., Nos. 56 and 64).

Lithium Bitartrate. According to Beilstein (3rd ed., vol. 1, p. 791) this salt was first prepared by Schabus in 1854. The fact that Merck in his report for 1895 (Bericht, p. 98) refers to the use of this salt in America under the name of tartarlithine, evidently has caused it to be enumerated with remedies introduced in 1896. Merck refers to the Lancet (June 30, 1894) and to Dental Cosmos (Sept. 1894) as the source of his information.

Malarine. This new antipyretic and neuralgic is made by Valentiner Schwarz of Leipzig-Plagwitz. It is the citrate of acetophenonephenitidide, a condensation product of acetophenone and p-phenetidine, $C_2H_5O.C_6H_4N{=}(CH_3)C_6H_5$. It melts at 88° and is but sparingly soluble in the ordinary solvents at low temparatures. (Pharm. Ztg., pp. 672, 829, 865).

Mydrol or iodo-methyl-phenyl-pyrazolone. According to the Pharm. Centrh., 1896, p. 718, this compound was prepared by Barbiano: when, is not stated. The Centrh. reports principally on the examination of Cattaneo (Boll. della soc. mediche 1896, April), who states that it is a mydriatic but that the mydriatic action is not as complete as with atropine. It is not to be confounded with mydrine, which is a mixture of ephedrine and homatropine.

Naphthol-bismuth, or bismuth β-naphtholate, is a compound which according to Schmidt (Pharm. Chem. II, p. 1048) possibly has the composition $C_{10}H_7O(BiO)$; according to B. Fischer (Die Neueren Arzneimittel, 6th ed., p. 28) the composition is expressed by the formula $Bi_2O_2(OH).(C_{10}H_7O)$. Inasmuch as Schmidt's work was published in 1895 and Fischer's sixth edition in 1894, this compound cannot very well have been introduced in 1896.

Nutrose. In 1894 Roehmann delivered a lecture before a section of the Naturf. Vers. in Vienna (Pharm. Centrh. 35, p. 636) on the nutritive value of the sodium- and other saltlike compounds of caseïne. It would seem as though the introduction of the trade name, nutrose, evidently by the Farbwerke in Hoechst a. M. (Pharm. Centrh. 37, p. 718) was the cause for its enumeration with remedies introduced last year. The nutritive value of this substance has been examined by others as well as by Roehmann. See also Pharm. Post 29, p. 480.

Oxycamphor. This compound $C_{10}H_{15}O(OH)$ has been known for a number of years. According to the Pharm. Ztg., 1896, p. 696, R. Heinz recommended it against asthmatic troubles at the time of the Naturforscherversammlung at Frankfurt (1896).

Oxysparteïne hydrochloride was prepared by F. B. Ahrens and reported upon by him in 1891 (Ber. d. d. chem. Gesellsch., 24, p. 1095). It has repeatedly found its way into pharmaceutical literature since then. The statement of Langlois and Maurange (source of information not given) that it was better adapted than sparteïne to avoid interference with heart action during chloroform narcosis seems to have been the cause for classifying it with remedies introduced last year. See Pharm. Ztg., 1896, p. 672; also Ph. Centrh., 1896, p. 134.

Parachlorphenol. According to Beilstein, p-chlorphenol was first prepared by Dubois in 1866 (3rd ed. II, p. 669.) The Pharm. Centrh. for 1891 contains two articles (pp. 361 and 725) on the use of chlorphenols and chlorphenol resp. as antiseptics, without, however, specifying which isomer was used. In the same journal for 1894 (p. 557) is contained an abstract of Eisenberg's article on the use of parachlorphenol in the treatment of lupus. The same journal for 1895 (pp. 62 and 107) contains two more notices about the same substance. It can, therefore, hardly be considered as having been introduced in 1896, merely because Sprengler recommended its use in a certain form of tuberculosis in that year. (Pharm. Ztg., 1896, p. 108.)

Phenetidine citrate. The mono- and di-phenetidine citrates obtained by the condensation of p-amidophenetol with citric acid in varying proportions. The process is patented by von Heyden in Dresden-Radebeul.

Monophenetidine citric acid has the formula $C_3H_5O.(COOH)_2.CONHC_6H_4OC_2H_5$; diphenetidine critic acid the formula $C_3H_5O(COOH)(CONHC_6H_4OC_2H_5)_2$. Both are sedatives, antipyretics, and analgetics. (Pharm. Ztg. 1896, p. 511.)

Pellotine. In 1894 (Ber. 27, p. 2975) Heffter made his first chemical report on pellotine and anhalonine, two alkaloids obtained from the cactus family. Since then he has made several chemical and pharmacological reports. See this journal, vol. 14, p. 153, and the Therap. Monatsh., vol. 10, p. 327. The latter journal (p. 328) contains also Jolly's report on the hypnotic effect of the alkaloid.

Pyrantine, or p-ethoxyphenylsuccinimide or phenosuccine, $(CH_2CO)_2N.C_6H_4.O.C_2H_5$, was prepared by A. Piutti. It is but sparingly soluble in water (1:1317). The soluble pyrantine of the same chemist is the sodium salt of p-ethoxyphenylsuccinamic acid, $NaOOC.C_2H_4.CO.NHC_6H_4.OC_2H_5$. It is readily soluble in water and has the same physiologic properties as the insoluble pyrantine. Both are antiseptics and are prepared for the market by the Farbwerke at Hoechst. Prof. Piutti's first article appears to have appeared in Aug. of 1895 in the Archivio Internazionale delle Scienze medico chirurgiche. A German translation appeared in the Arch. f. Pharm., 1896, p. 161. (14, p. 66; comp. also this vol., p. 15.)

Quinaphtol or Chinaphtol is β-naphthol-α-mono-sulphonate of quinine. According to Pharm. Ztg., 1896, p. 829, and Pharm. Centrh., 37, p. 829, (from Wiener med. Bl., 1896), this substance was first prepared by E. Riegler and is manufactured by E. Merck.

Quinine hydrochlor-sulphate. Georges in the Journ. de Pharm. et de Chim., 1896, 12, reports the results of his examination of various commercial specimens. He finds both anhydrous and hydrated salt and does not consider the preparation as a chemical unit but as a mixture, for reasons (as quoted in the Pharm. Ztg., 1896, p. 453), which are not readily comprehensible. When the compound was introduced in France is not stated.

The Am. Journ. Pharm., for 1893, vol. 65, p. 174, contains an abstract from the Compt. rend., with regard to its preparation. The same journal on p. 492 contains an abstract from the Suedd. Apoth. Ztg., 1893, p. 339 with regard to a German patent. The fact that a Frenchman examined several commercial specimens in 1896 can hardly be considered sufficient reason for stating that it was introduced during that year.

Salhypnone. The benzoyl derivative of methyl salicylate was prepared by H. Voswinkel, and apparently first reported on in 1896. It is reported to have no particular physiological action. Pharm. Ztg., 1896, I, p. 159.

Sanoform. According to the Pharm. Ztg., (1896, p. 320 and 418), diiodo salicylate of methyl was prepared by A. Gallinek and E. Courant in the summer of 1895. Like methyl salicylate it is said to be a powerful antiseptic and is recommended as a substitute for iodoform.

Stypticine is a recently invented synonym for cotarnine hydrochloride, known for a number of years. In Merck's Bericht for 1894 attention is called to the fact that the hydrochloride of this opium alkaloid on account of its solubility and permanence would be best adapted to physiological experiments. In 1895, at a medical congress at Vienna, Gottschalk reports on the styptic properties of this compound "prepared by Merck." (Pharm. Centrh., 36, 410). This seems to explain the newness of this remedy.

Tannoform, or methylene ditannin, a condensation product of formic aldehyde and gallotannic acid was first prepared by Merck. He reported on the chemical and therapeutical properties of the compound in his Bericht for 1895. In this report he also calls attention to a lecture delivered by W. M. Frank in Berlin, Dec. 3, 1895 on the dermatological value of this compound. It was, therefore, introduced therapeutically as well as chemically in 1895.

Tetraallylammoniumalum, $N(C_3H_5)_4 . Al_2(SO_4)_3 + 12H_2O$, was prepared by Orlow (Pharm. Zeitsch. f. Russl., 1895, p. 755) evidently in 1895. Inasmuch as tetraallylammoniumhydrate readily dissolves uric acid the Russian chemist expects this alum to become of use in medicine as a uric acid solvent.

Literary.

Books and Pamphlets Received.

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F.C.W. Vogel—Leipzig. Grundriss der Arzneimittellehre. Von Dr. Oswald Schmiedeberg. Dritte umgearbeitete Auflage. Ein Bd., pp. x, 386. 1895.

Ginn & Company—Boston. Inorganic chemical preparations. By Dr. Frank H. Thorp, Instructor in Industrial chemistry in the Mass. Inst. of Techn. One vol., pp. IV, 238. 1896. $1.60.

Hermann Heyfelder — Berlin. Chemisch-technisches Repertorium. Herausgegeben von Dr. Emil Jacobsen. 35. Jahrgang. 1896. Erstes Halbjahr. Zweite Hälfte. pp. 117—283. 1897.

State of Wisconsin — Madison. Biennial report of the Dairy and Food Commissioner. For the years 1895—1896. One vol., pp. 315.

E. R. Squibb and Sons—Brooklyn. An ephemeris of materia medica, pharmacy, therapeutics and collateral information. Vol. IV, No. 5. pp. 1759—1923. By E. R. Squibb, E. H. Squibb and C. F. Squibb.

Authors—Rio de Janeiro, Brazil. Historia dos plantas medicinaes e uteis do Brazil. Por Theodoro Peckolt e Gustavo Peckolt. 6.° Fasciculo, pp. 923—1118. 1896.

Author—New Brunswick, N. J. Modern surgical dressings. By T. B. Kilmer. Reprint from Am. Journ. Pharm. Pamphlet, pp. 16. 1897.

Author — Mobile, Ala. Notes on some undescribed and little known plants of the Alabama flora. By Charles Mohr. Reprint from the Bull. of the Torrey Bot. Club. Pamphlet, pp. 11, with three plates.

U. S. Dep't. of Agricult.—Washington. Report of the Botanist for 1896. By Frederick V. Coville. Pamphlet, pp. 10. 1896.

Reviews.

The American Annual of Photography and Photographic Times Almanac for 1897. Edited by Walter E. Woodbury, F.R.P.S. pp. 370, with 300 illustrations. The Scovill & Adams Co., N. Y. Paper, $0.75, cloth, $1.25.

It is easy to believe that in this volume we have examples, in part at least, of the best American photographic work of the past year. Of the contributed articles several are of scientific interest; such as those on acetylene in microphotography, astronomical photography with photomicrographic apparatus, the efficiency of shutters, experiments with developers of the aromatic series, and on the research work of Dr. Joly in color photography.

Nor does the discovery of Roentgen lack ample notice. Mr. Alfred Stieglitz writes entertainingly of the hand camera and its importance, which he fully proves by stating that his best work (now so widely and favorably known) is mostly produced by this method and subsequent enlargement. Mr. J. W. Champney contributes a valuable article, well illustrated, on lighting in portraiture.

Mr. Walter Sprange in "Subjects for exposure" and Mr. J. Carpenter writing on Constable's country, certainly persuade every camera owner to make the most of his travels. To many readers, an interview with the late Napoleon Sarony chiefly concerning Bernhardt, will prove of interest.

Standard formulae, tables chemical and optical, receipts, etc., occupy about 75 pages, and seem capable of yielding any information that may be desired upon matters photographic.

It is, however, for its admirable array of illustrations that the volume most deserves praise. Despite the fact that the omission of certain ones would have been a distinct improvement, the average merit is surprisingly high. From Adoration by Chas. Berg to the excellent Devotion by Dexter Thurber, the reader finds evidence of artistic feeling intelligently directed and withal, clever technique.

There are many small bits, chiefly landscapes, that one is apt to hurry over, but upon a second examination they assert their merit and will be found fruitful in hints to workers.

For the general excellence of make-up, paper, engraving and typography, the editor and publishers deserve much praise. The volume will prove itself almost a necessity to those who use the camera, as it will delight all lovers of artistic photography.

We shall expect much of the American Annual hereafter. *W. H. Dudley.*

Proceedings of the American Pharmaceutical Association at the forty-fourth annual meeting held at Montreal, Canada, August, 1896, also the constitution, by-laws and roll of members. One vol., pp. xxviii, 963. Baltimore: Published by the Am. Pharm. Assn., 1896.

Members of the Am. Pharm. Assn. will be glad to receive the annual volume of Proceedings at least midway between the two annual meetings. The reason why it has appeared somewhat earlier this year than last is possibly to be sought in the difference of several hundred pages between the two volumes. Attention was called last year to the task of publishing such a volume annually, also to the work involved in compiling the Report on the progress of pharmacy by a single person.

It is gratifying to note that considerable pruning was successfully accomplished in the editing of the discussions. These discussions as printed have not infrequently been full of errors, misleading and even false. Words spoken by one have been attributed to another. Consequently their historical value is exceedingly doubtful. The absence of discussions from the report of one of the sections will be missed by only a few. It shows clearly how well we might get along without them. The pharmaceutical journals represented at the meetings report them more or less in detail and this ought to suffice to satisfy the speakers. The association has no money to waste and to have economized in this direction speaks well for those who had the courage to remove a large part of this ballast. Let us hope that even more may be accomplished in this direction in the future.

That part of the volume which is new to most is the Report on the progress of pharmacy. It represents an enormous amount of work which is but little appreciated. This Report corresponds to the British Yearbook of Pharmacy and to the German Jahresbericht der Pharmacie. As long as these reports remain the work of but one or even several persons they can never be much more than a catalogue. If the compiler desires to do more he will preface his catalogue, as the Reporter has done for 1895/6, by a general retrospect. Having accomplished this he has done about all that can be expected of him.

If one stops to consider that yearbooks on chemistry mostly cover special fields of the science and even then are usually written not by one person, but by a number of specialists, one cannot help but think that the editing of a yearbook of so manysided a subject as pharmacy is not only an enormous task, but a bold undertaking.

Those who in the past have criticized the Report on the Progress of Pharmacy should criticize the compiler less, but the association more for asking a single person to undertake such an herculian task. As the writer has pointed out in reviewing the German Jahresbericht, the practicing pharmacist cares less for a compilation of facts, very few of which he can apply. What he wants is a general survey of the year's progress in pharmacy and the sciences closely related to pharmacy. This, however, can never be the work of one man.

The writer wants it definitely understood that he has not the slightest intention of criticizing the present Reporter. Even when the work was not as well done as at present the writer has always refrained from saying or writing anything derogatory about the Reporter, because he knows enough to respect a person who will do so much valuable work that so often has received more criticism than praise. It may, however, not be amiss to call attention to the fact that the system has been outlived and that a better one is in vogue in other departments of science. *E. K.*

Inorganic Chemical Preparations. By Frank Hall Thorp, Ph. D., Instructor in Industrial Chemistry in the Massachusetts Institute of Technology. One vol., pp. 236. Ginn & Company, Boston. 1896. $1.50.

The author says "This book owes its existence to the need which the writer has experienced, of more specific instructions than can conveniently be given orally to students beginning a course of laboratory practice in inorganic preparation work."

Part first contains directions for the necessary operations, such as Solution, Precipitation, Filtration, Decantation, Washing, Evaporation, Crystallization, Drying, Determining the density of solutions both by the hydrometer and the pyknometer, Calcination and Pulverizing. Ten general directions are also given which well deserve the careful attention of students. This introductory portion occupies thirty-eight pages.

Part second, the experimental part of the book, contains directions for making one hundred chemical preparations. In many cases more than one method of preparation is given, and the directions seem full and complete. Besides the directions for manufacture, in nearly every case the author gives the molecular weight of the substance, the chemical reactions occurring in its production, its properties, and in many cases the uses to which it is put. An admirable feature of the book is the frequent references given to the sources drawn upon for the methods given. Nearly every page contains references to periodicals containing the information here given necessarily in an abbreviated form.

An appendix contains tables of the specific gravities and percentage composition of hydrochloric, nitric, sulphuric and acetic acids of various concentrations, and also of "liquor ammoniæ," also a table of approximate atomic weights and valence of the elements.

The book is a good one, and may be cordially recommended to all seeking instruction in the preparation of inorganic salts.

W. W. Daniells.

Lehrbuch der Allgemeinen Chemie, von Dr. Wilhelm Ostwald, Professor an der Universität zu Leipzig. In zwei Bänden. Zweiten Bandes zweiter Theil: Verwandtschaftslehre. Erste Lieferung: pp. 208. Zweite umgearbeitete Auflage. Verlag von Wilhelm Engelmann, Leipzig. 1896.

The written works of Prof. Ostwald notably his Treatise on general chemistry are too well known to demand either an introduction or a general comment. Attention has been duly called to the parts that have already appeared. The greater part of this fascicle is taken up by Book one: The history of the theory of affinity. Only a few pages are occupied by part of the first chapter of Book two: Chemical dynamics. The development of the theory of affinity from its earliest beginnings to the present day constitutes one of the most interesting chapters in chemical history. Possibly in no other book is it discussed in such thorough manner. The chapters in which the history of the theory of affinities is discussed can be enumerated as follows: History of chemical theories; Older history of the determination of affinities; Newer history of theory of affinity until 1886; The development of the theory of affinity in the last ten years. Chapter one discusses briefly the notions which the ancients held of affinity, the development of the hypothesis of the elements and atoms through the various chemical periods, the corpuscular hypothesis with its wild outgrowths of the imagination, the electrochemical hypothesis and the theories of Davy, Berzelius and others.

In the second chapter it is pointed out that Glauber and Boyle were the first who referred many chemical changes to a difference in chemical "forces". Stahl's affinity series and Geoffroy's table are there discussed. Bergmann's theory of affinity, adhesion and affinity, attempts at the formulation of laws governing affinity, mass-action, the theories of Wenzell, Berthollet etc. constitute subchapters of the detailed discussion that follows.

The third chapter begins with the quantitative theory of Guldberg and Waage. The fourth chapter, after a brief general introduction takes up van't Hoff's theory of solutions. Inasmuch as several English chemists and physicists have recently tried to discredit the theory of solutions and ions by casting ridicule upon it, it may not be amiss to quote the last paragraph of this chapter: "Durch die in den letzten Paragraphen geschilderten Fortschritte wurde die Theorie der freien Ionen mit der bis dahin bestehenden Lehre vom chemischen Gleichgewicht vollständig vereinigt, und sie hat hier ihre überall bewährte klärende und fördernde Wirkung im weitesten Masse bestätigt. In der Folge wird sich vielfach Gelegenheit ergeben, zu zeigen, wie nur durch diese Theorie ein volles Verständniss der Erscheinungen ermöglicht und die Beseitigung von Widersprüchen bewerkstelligt werden konnte. Ihre Bedeutung auf diesem Gebiete ist nicht geringer anzuschlagen, als in der Electrochemie, und hier wie dort sind neben den gelösten Aufgaben noch zahllose andere vorhanden, die der Lösung harren, nicht weil sie mit den gegenwärtigen Mitteln unlösbar wären, sondern weil die Fruchtbarkeit der neuen Anschauungen zu gross gewesen ist, als dass die wenigen Arbeiter auf dem Gebiete bisher im Stande gewesen wären, die reife Ernte unter Dach zu bringen". *E. K.*

Chemisch-technisches Repertorium. Uebersichtlicher Bericht über die neuesten Erfindungen, Fortschritte und Verbesserungen auf dem Gebiete der technishen und industriellen Chemie mit Hinweis auf Maschinen, Apparate und Literatur. Herausgegeben von Dr. Emil Jacobsen. 35. Jahrgang 1896. Erstes Halbjahr. Zweite Hälfte. pp. 117—283. R. Gärtner's Verlagsbuchhandlung (Hermann Heyfelder), Berlin. 1897.

The second fascicle contains abstracts of articles grouped under the following subject headings: foodstuffs and beverages; paper; photography and reproduction; byproducts, waste products, fertilizers, disinfection and technical hygiene and sanitation; soap; matches etc., explosives; preparation and purification of chemicals; chemical analysis; apparatus, machines, electro-technology, thermo-technology; appendix: secret remedies, adulteration of commercial articles etc.; new books. Pieces of apparatus are illustrated by cuts in the text. For persons interested in technical chemistry this quarterly is exceedingly valuable; for such, who do not enjoy liberal library facilities, when once used it will no doubt prove indispensable. *E. K.*

Historia das plantas medicinaes e uteis do Brazil. Por Theodoro Peckolt e Gustavo Peckolt. 6.° Fasciculo, pp. 923—1118. Companhia Typographica do Brazil, Rio de Janeiro. 1896.

Part six of the account of the medicinal and otherwise useful plants of Brazil by Theodor and Gustav Peckolt of Rio de Janeiro has appeared. This number contains the following families: *Chloranthaceæ*, *Piperaceæ*, *Polygonaceæ*, *Aristolochiaceæ*, *Loranthaceæ*, *Balanophoraceæ*, *Salsolaceæ* and *Amaranthaceæ*. We have here collected in pamphlet-form the results of researches of this veteran pioneer and his son. The botanical and common names of the various plants, the botanical descriptions, chemical constituents and uses, medical and otherwise, here find place. Fortunately these investigators more frequently address their readers in the German language than, as in the present instance, in Spanish. *R. H. True.*

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EDITORIAL.

A peculiar circumstance in the development of secret remedies in this country has led to their designation as "patent medicines" by the general public and even by professional men. This is exceedingly unfortunate. It has given rise on the one hand to a denunciation of medicinal substances that are rational in composition but protected by a legitimate patent. On the other hand it has caused the secret remedy to rise in favor even with people whose so-called ethics places them on a plane from which they look down upon the greedy and "unprofessional" patentee.

A general storm of indignation has been raised against foreigners who have availed themselves of our patent and trade-mark laws in preventing all competition, whereas the energies should be directed against our barbarous laws that sanction highway robbery. This irrational feeling is so general that many who have better convictions fear to express them or at least put them into practice. The result is that a person like Dr. Chas. Rice is maligned and has his motives questioned; that manufacturers and individuals instead of enriching science by valuable information in their possession keep it secret. True it is that in some instances, where public opinion is not feared, they would rather trust to secrecy than to government protection if their knowledge were published and patented.

It is of interest to note that some of those who most violently denounce the foreign patentees are sometimes most rhetorical in guarding the secret nostrum manufacturer. Physicians are also largely to blame. Their theoretical ethics does not prevent them from having their published works registered, but forbids the patenting of almost every thing else. As societies they denounce secrets in their sessions, but allow secret remedies to be advertised in their proceedings under the guise of scientific articles. As individuals they liberally use them in their practice.

In connection with this problem it may be of interest to mention the definition of a secret remedy given recently by the official medical board of Saxony: "Secret remedies are all those agents sold for the prevention and cure of disease of man and animals, of which the ingredients, percentage composition, and method of preparation are not made public when first announced and offered for sale. Such information must be complete and exact in readily comprehensible language and made known to all desirous of such information."

◆

The Manufacturing Laboratory in the Household of Pharmacy.

During the past hundred years a most remarkable industrial revolution has taken place. It has not only affected industry in all its branches, but has had its influence upon society as a whole.

The change in general has been so complete that the present generation is largely ignorant of the "good old times" of the master-workman, of his assistants and apprentices. The large shop, with little or nothing about it to make it home-like, has almost entirely displaced the older combination of work-shop and home. Whereas the economic differences brought about have readjusted themselves to a considerable extent, the more social differences have been emphasized rather than readjusted as time went on. Still there remain numerous economic problems as well as the social problem to be solved.

Pharmacy, though conservative, has not been able to isolate itself from the general movement; it was, though reluctantly, swept away with it. Of the numerous callings that have undergone more or less radical changes since the French Revolution, pharmacy appears to have been least prepared for such change. At the close of the last and at the beginning of this century the pharmacies of Europe were almost as many cradles of the then infant sciences. Men whose names gave lustre to chemistry emenated from the apothecary shops, and Scheele, who lived and died as apothecary, is to-day regarded as one of the most remarkable men in the history of chemistry. The druggist of to-day is literally dead and buried among his bottles, like himself largely relics of the past. Such, from a scientific point of view, has been the fate of the average druggist. Commercially his fate has not been very different. The proverbial x-hundred percent have become a mockery. The difference between the average drug store and the department store against which, at present, so many rage is principally a difference of size and number of departments. Those pharmacists whose education and skill enabled them to rise above their surroundings, have in many instances as manufacturers left the retail pharmacy behind.

With the concentration of capital and business interests the watch-word of to-day has become specialization. Though the business interests of a large firm may be watched over and even directed by a central executive office, the detail work is conducted by specialists. The scientific work is accomplished almost entirely by men who give much of if not their entire time to investigation. Between the two the practicing pharmacist at present does not occupy a very enviable position. Financially as well as scientifically, and consequently socially, he has not kept pace with the rapid onward march of the past hundred years.

Laboratory of Schieffelin & Co.

Here lies the root of the present evil. The apparent rupture into factions has even given rise to the notion, that on account of differences which have arisen, the various branches which have grown out of a former unit no longer have anything in common. Practices, that have unfortunately prevailed to no small extent, have even placed those, who in not a very distant past were one, into hostile camps. The one at least apparently follows successfully the dictum that God helps those that help themselves, whereas the other having failed in assistance by the government begins to despair of self help.

The meaning of the word pharmacy has undergone numerous changes during past centuries, it is changing at present and no doubt will continue to change in the future. It to-day means one thing in the civilized countries of Europe and America and quite another thing in the semi-civilized countries of Asia. This, however, will no doubt prove true: that the future historian will include the pharmaceutical manufactories in the history of pharmacy of the nineteenth century, and moreover as having played a most remarkable part in the development of our calling. Whether they have been a benefit or an evil, or a not wholly unmitigated good is another question. This the future historian may decide. There is no doubt that they have come and have come to stay for some time at least.

Considering the manufactories as part and parcel of pharmacy the Review has from time to time called attention to advancement made in this direction as well as e. g. in the direction of pharmaceutical education etc. The establishment and growth of one of the most unique pharmaceutical factories and the present resources and accomplishments of possibly the largest pharmaceutical manufacturing establishment the world has ever seen have been depicted in the earlier volumes of this journal. [**5**, 254; **10**, 12, 149, 275; **11**, 175.] Within little more than a year another factory has been firmly established and fully equipped that has attracted attention especially to its architectural and structural peculiarities and advantages.

It has been remarked that we in the United States were prone to lay more stress upon large and handsome college buildings than on a sound and thorough college curriculum and a good instructional force. To the late A. W. v. Hofmann, while on a visit to this country, are attributed the words: "A large building does not make a college of pharmacy." In his address, delivered in Goettingen in August 1890, the same veteran scientist, alluding to the unpretentious laboratory in which Woehler achieved results that revolutionized chemistry, remarked: "Es kommt nicht auf den Käfig an. Die Frage ist, ob der Vogel, der darinnen sitzt, singen kann."

Research Department.

It is no doubt true that much money has been wasted in elegant "câges" and that less stress has been laid upon securing "birds" that could "sing". Yet it may be said in partial justification at least that college buildings are not erected for a few years but for generations. It is proper, therefore, that due consideration should be given to appearance and future utility. That this opinion is held in Germany as well as in this country is sufficiently demonstrated by the magnificent buildings that are rapidly taking the place of the older modest scientific institutes.

Pharmaceutical journals have pointed to new and well equipped college buildings with considerable pride. Pharmaceutical education is such an important factor that the homes of our educational institutions merit all the attention that we can afford to bestow upon them without detriment to the cause for which the edifice is the outward symbol. The interest should not center merely in the structure as an architectural accomplishment. The question is whether a given building with its modern improvements and equipments is best adapted to serve the cause of pharmaceutical education.

From the same standpoint we may be justified in viewing the homes of our large manufacturing establishments as well as the arrangement and equipment of our modern pharmacies.

It is a hope cherished by some that higher education will revolutionize pharmacy of to-day and lift her out of her present unenviable situation. The manufacturing industries, however, have revolutionized pharmacy of fifty years ago and are to no small extent coresponsible for the present state of affairs. The pharmaceutical profession as a whole is justified in asking what a particular branch is doing for the general good. Is the pharmaceutical manufacturer in the erection of his buildings, in the equipment of his laboratories and in the selection of his working force simply bent upon making so many thousands of dollars a paying investment, viewed from a merely commercial standpoint, or are his doings influenced to some extent at least by higher than purely mercenary motives.

The fact that scientific inertia or retrogression result in commercial stagnation and ruin has been fully appreciated in Germany. England and America have just begun to learn this lesson. German manufacturers have not only been liberal in assisting scientific research for its own sake, but some of the German factories employ more chemical investigators than can be found in the largest university. The scientific director of such a factory is assisted not only by a small army of able chemists, but by a corps of scientifically educated engineers as well. The result has been that the label "made in Germany" has successfully entered every port.

That the American chemist, engineer and architect, if they join their best efforts, can accomplish something of which they need not be ashamed when compared with the very best the old world has produced, has been demonstrated comparatively recently.

Analytical Department—West Side.

A chemical laboratory is proverbially an institution to be dreaded, and to be placed under ban by the community which it has invaded. The pleasant exterior of the new building erected by Messrs. Schieffelin & Co. on St. Ann's Ave. and 132nd St. in New York City does anything but justice to the traditional popular requirement of such an institution. The general style of the building is perfectly in harmony with its use, and at the same time pleasing and, no doubt, to most persons a surprise. If the exterior has proven unusual and interesting, the interior is even more so.

In the construction one of the principal objects has been not only to make the building as such fire-proof, but to make each section a fire-proof unit. In order to obtain at the same time a large floor-space unobstructed by as few columns as possible, a peculiar construction became necessary.

It consists of steel columns supporting a triangular frame work of steel beams, which are braced by brackets, thus allowing a very wide span between the columns, on the cantelever system. The spaces between the steel beams are filled in solidly with a concrete of Portland cement. Therefore, as there are no openings between the floors, and as the partitions are made of rock plaster on metal, if any fire occured, it would be confined to the room in which it started.

The floors are all graded to different flush outlets, and the sills of the doors are raised three inches above the floors, so that no water can overflow from one floor to another and thus do damage which might not be occasioned by fire. The window frames are of iron, and in the places where the fire shutters would be required by law they have been replaced by wired glass window panes, which may soften and crack during the course of a fire, but which never will break out, fall in, or warp, and, therefore, are most effectful in confining the flames to the room where the fire may be. The doors in the building are fire-doors and are hung with counterpoised weights, connected by a fusible connection, which melts when the temperature is raised, and allows the door to slide shut. There are three fire-escapes to the building; one at the end of each wing, and one at the back. The two front fire-escapes are of stone, and are enclosed in brick towers. The elevator, dumb-waiter and chutes for refuse are all on the outside of the building.

All the power that is needed on the upper floor is transmitted by electricity, thus avoiding holes in the floor for belting or for vertical shafts. This power is supplied by a large dynamo which also lights the entire building.

In the rooms where naphtha, ether, or other inflammable solvents are employed, the electric lights have sleeves of rubber and are on one circuit, controlled by a switch in another part of the building, in order to avoid any chance of a spark.

The floors of the different departments are of different materials, to correspond with the varying character of the work done. Where the work is dry, the floor remains of concrete, smooth and clean. Where water is apt to be spilt, as in the chemical department, the bottle washing room, and the pharmaceutical department, the floors are made of asphalt. In the acid and nitrous ether room the floor is of blue-flag stone laid in oil tar, graded to an earthenware drain pipe; and where much oil is used the floor is galvanized iron.

Analytical Department—East Side.

There are a number of drying rooms both hot (steam heated) and cold. They are supplied with flues, and the air is exhausted by means of a large Root Blower. The mill drying room is situated immediately over the boilers, where a high temperature can be maintained.

The work in the laboratory is divided into departments, namely, the Analytical Department, Mill Department, Chemical Department, Extract Department, Pharmaceutical Department, and the Wrapping and Shipping Department.

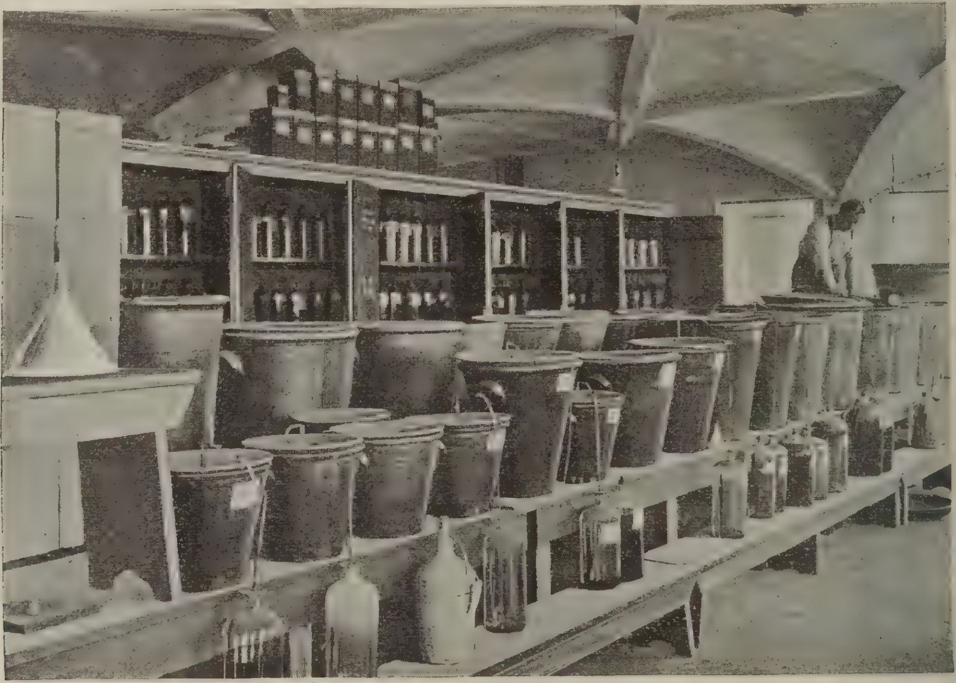
The analytical department is in charge of two chemists, and besides analyzing and testing almost everything that is received or sent out, they are occupied with research and experimental work. This department occupies one end of the large building on the second floor, covering a space of 50x30 feet, divided by a solid oak partition, with plate glass top. One side is used for the laboratory work proper, for which there is ample apparatus and many improved fittings, such as centrifugal machines, suction and blast pump, steam water baths, drying closets, hood, etc. The sink and drain-board is made of cherry treated while in the drying kiln with two applications of melted paraffine. The electric lights in this whole department are on movable arm brackets, enabling the light to be put in any position desired.

In the adjoining room is an excellent library of works on chemistry, a file of current chemical literature, including some eight German and fifteen English periodicals, improved balances, and high power microscope; all on a working table which is covered with plate glass. The floor of this department was given two coats of paint to avoid any possibility of dust from the concrete. There is also a dark room for photographic and polariscopic work.

The other departments are fitted with appliances appropriate for their work. The most interesting perhaps are the large percolators in the chemical department, and the mammoth mixer with a capacity of one thousand pounds, and also the copper stills in the extract department.

The above description calls attention primarily to those things which are peculiar to this laboratory rather than to those which most laboratories have in common. It seems almost unnecessary to state that most if not all of these improvements have been tried elsewhere. It is the bringing together of all that have proven successful into one organic whole, as it were, that makes the Schieffelin Laboratory so interesting and instructive.

To enumerate the chemicals and pharmaceutical preparations made in this laboratory would result in a list resembling very much a copy of a chemical or pharmaceutical catalogue and would be of little value. It may be of interest, however, to call attention to the progress made in recent years not only in the assay of cocaine, but also in its manufacture. Dr. Schieffelin remembers well when in his student days a measurable crystal of cocaine was a scientific curiosity. To-day beautiful crystals of considerable size are an every day occurrence in this laboratory. What is of more importance than size and beauty is that they are equally pure.

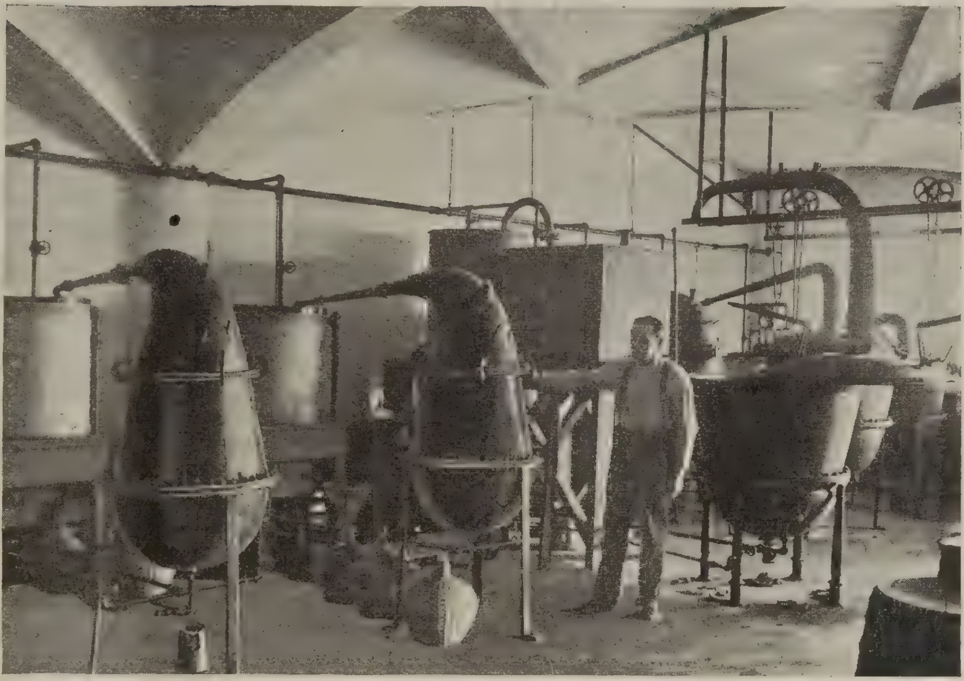


Extract Department:—Process by cold repercolation.

Among the galenical preparations it was of special interest to note with what painstaking care e. g. the medicated soaps, dehydrated and benzoated lard etc. are being prepared. The necessity of covering deficiencies by color does not exist where science seems to have taught perfection.

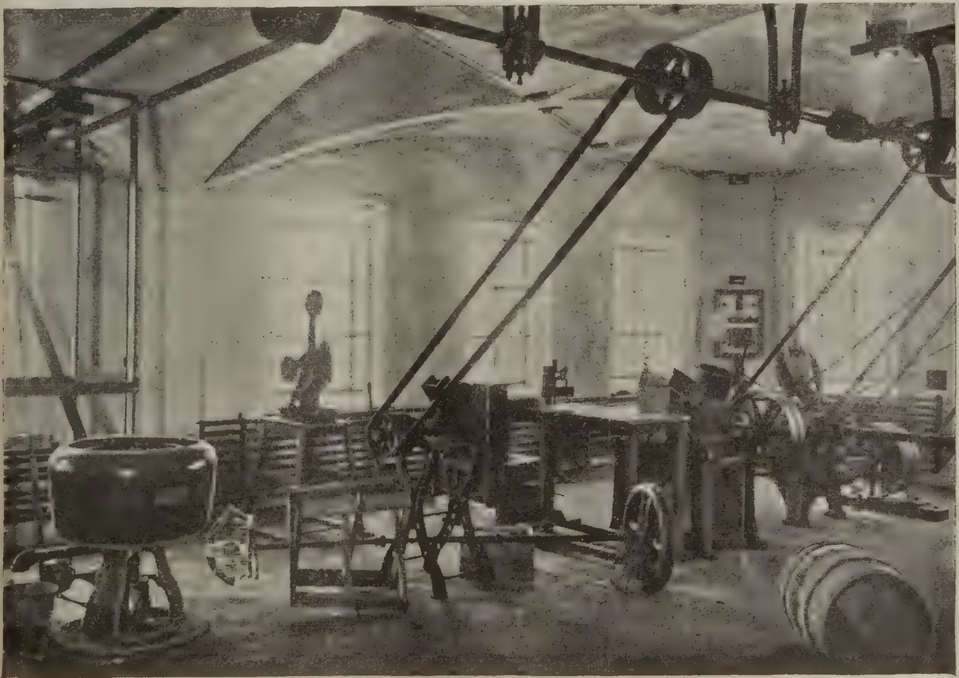
The writer has attempted in as few words as possible to give some, though an inadequate idea of this new laboratory and of the work that is being accomplished in it. Dr. William J. Schieffelin, who has kindly taken the writer through the laboratory and explained it in all its details, has at the request of the Society for Chemical Industry read a paper on Fire proof laboratory construction before the New York Section, giving a detailed account of the architectural and structural details of the building. This account appears in the journal of the society.

A general description of the laboratory has also recently been published in the anniversary number of the Pharm. Era.



Extract Department:—Copper Stills.

The Pharmaceutical Review has always laid more stress on the general aspect of pharmaceutical problems and institutions than on minor details. Whereas a repetition of descriptions already published seem uncalled for it may not be amiss to give a less detailed description in which emphasis is laid on the position of the manufacturing laboratory in the household of pharmacy. Although the large laboratories have seemingly been detrimental to the pharmacist, like the large factories to the home industries, this detriment will last only until readjustment has taken place. In both instances we record a progress that has not only proven a benefit to mankind in general, but has and will more fully prove beneficial to those directly concerned. There is no reason why we should not welcome every important advance in pharmaceutical manufacturing as well as in engineering, transportation, etc. Progress may work a temporary hardship to some, at least for a time. The inevitable necessity is readjustment along the lines of progress. This may not always be an easy matter, but it will in itself be an advance more important than its forerunner which has necessitated it.



Centrifugal and Medicated Soap Machinery.

E. K.

ORIGINAL CONTRIBUTIONS.

The Relative Strength of Antiseptics.

By Dr. *Louis Kahlenberg*.

Many of the important antiseptics are aqueous solutions of salts or acid or basic substances. During the last decade our knowledge of the nature of solutions and especially of those of the class just mentioned has been greatly increased. New facts concerning these solutions have been discovered and a theory has been formed explaining these facts as well as many others that have long been known and yet have hitherto not been satisfactorily explained from theoretical standpoints of view. In 1887 van't Hoff[1] using the experimental results on osmosis obtained by Pfeffer[2] ten years earlier laid the foundation of the new theory of solutions by pointing out an almost complete analogy between the behavior of gases and solutions. He showed that, considering the temperature constant, the osmotic pressure of a solution is the same as the pressure exerted by the gas if the same amount of substance that is dissolved in the solvent is thought of as being volatilized and as occupying the same volume as that possessed by the solution. Thus van't Hoff demonstrated how the laws of Boyle and Gay Lussac also apply to solutions. His work enabled him to extend the hypothesis of Avogadro to solutions: Equal volumes of all solutions having the same temperature and the same osmotic pressure contain an equal number of molecules, which number is identical with that contained in a gas having the same volume, temperature and pressure.

The relations existing between the osmotic pressure of a solution and the diminution of the vapor tension (or the elevation of the boiling point) or the lowering of the freezing point of the same were fully explained by van't Hoff from a theoretical standpoint of view. He thus furnished a firm scientific basis for Raoult's empirical methods of determining molecular weights of dissolved substances from the diminution of the vapor tension or the lowering of the freezing point of their solutions.

The theory of van't Hoff explained very well the behavior of many solutions, still there remained a large class of solutions—particularly those of acids, bases and salts—that were found to exert a greater osmotic pressure than they ought to according to the theory. The difficulty that the theory met here is similar to the one that Avogadro's hypothesis had to contend with in accounting for the high vapor pressure or the low vapor density of such substances as ammonium chloride, which difficulties disappeared, however, when it was found that these substances are dissociated in their vapor state.

The solutions possessing a greater osmotic pressure than the theory required also showed too great a diminution of the vapor tension and too great a lowering of the freezing point. These solutions then acted as though they contained more molecules than was expected from the chemical formulæ of the dissolved salts. The explanation of their peculiar behavior was finally pointed out by Arrhenius to be that the dissolved substances are dissociated into part molecules. The explanation was then similar to that found for the abnormal vapor density of ammonium chloride.

Arrhenius[3] had been investigating the electrical conductivity of solutions and soon pointed out a close relation that exists between this property and the lowering of the freezing point. From his results he concluded that the solutions which in their behavior apparently deviate from the theory of van't Hoff in the sense mentioned are conductors of electricity, and that the substances they contain are dissociated into part molecules, the ions. These part molecules or ions are the atoms or radicals that are interchanged in the ordinary chemical reactions that aqueous solutions of acids, bases and salts undergo.

The theory of electrolytic dissociation, as the theory of Arrhenius is called, at first met with much opposition, but is now generally accepted. From the standpoint of this theory, a solution of hydrochloric acid, for example, contains H-ions and Cl-ions besides a certain amount of undissociated HCl. The dissociation is practically complete when 1 gram molecule (i. e. the molecular weight in grams) of the acid is dissolved in 1000 litres of water. In very dilute solutions then we have practically only H-ions and Cl-ions. These are charged with electricity, the former with positive, the latter with negative electricity. From experimentation on electrolysis it has been determined that each gram equivalent of ion bears 96540 coulombs. There are always as many positive ions as negative ions present in a solution, so that its electrical neutrality is preserved. Hydrogen ions and chlorine ions are not the same as hydrogen and chlorine gases. They differ from these in the energy they contain; the former contain less energy than the latter—supply the energy as we do in electrolysis and the ions are changed to hydrogen and chlorine gas respectively.

Dissociation increases with increase of dilution. It is complete only at infinite dilution. However, in the case of strong acids and bases and their salts dissociation increases so rapidly with the dilution that when a gram equivalent is contained in 1000 litres of water, dissociation is practically complete. If BA be the general formula of a salt, B being the basic radical and A the acid radical, then an aqueous solution will contain B-ions and A-ions together with a certain number of undissociated molecules BA. All the physical and chemical properties of solutions of electrolytes have been found to be due to the properties of the ions plus those of the undissociated molecules the solution contains.

It having always been taken as axiomatic that the physiological action of any substance is due to its chemical character, Kahlenberg and True[4] have made the statement, that "if in the case of the solutions in question, all the chemical and physical properties are due to the properties of the ions plus those of the undissociated molecules they contain, it seems very probable that the physiological effect produced by such solutions is also due to these." This thought was first presented to the Wisconsin Academy of Science, Arts and Letters at its meeting in December, 1895. It was again presented at the meeting of the American Medical Association in May, 1896, and was published in the Botanical Gazette in August, 1896.

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[1] Zeitschr. f. physik. Chem. I, 481.

[2] Osmotische Untersuchungen, Leipzig, 1877.

[3] Zeitschr. f. physik. Chem. I, 631, 1887.

[4] See Botanical Gazette, August, 1896.

At the meeting of the Wisconsin Academy, Kahlenberg and True, using the data contained in Miquel's table of the efficiency of antiseptics, as given in Sternberg's Manual of Bacteriology, showed that their statement held good for the toxic action of solutions on bacteria. It is true that this could only be shown in rough outline from these data as the strength of the solutions was given in per cent. In order that the results be directly comparable, the strength of the solutions must be given so as to allow chemically equivalent quantities rather than equal quantities by weight to be compared.

Kahlenberg and True determined the strength of various solutions in which the roots of the bean *Lupinus albus* L. will just live. Mr. F. D. Heald,[5] Fellow in Botany at the University of Wisconsin at the time these first experiments were in progress, was induced to further test the theory by determining the strengths of the solutions in which roots of other plants will just grow. He worked with the pea (*Pisum sativum*) and corn (*Zea Mais*). The results that were obtained fully confirm the general statement of Kahlenberg and True as quoted above. These results may be found in the proceedings of the Amer. Med. Ass'n and in more complete form in the Botanical Gazette.

In the December number of the Zeitschr. f. physik. Chem., Theodor Paul and Bernhard Krönig published an interesting article entitled "Ueber das Verhalten der Bakterien zu chemischen Reagentien". They tested the effect of aqueous solutions of various kinds on bacteria. The work was done mostly with spores of anthrax. Their methods of experimentation and their detailed results must be consulted in the original article. Their general conclusions are as follows:

"1. The salts of the noble metals, platinum excepted, those of gold, silver and mercury have a specific toxic power.

"2. The disinfecting power of metallic salts does not depend alone on the concentration of the metal contained in the solution, but is also influenced by the specific properties of the salts and the solvent. The view of Behring, that 'the disinfecting power of mercury compounds depends in the main only upon the amount of mercury in solution, be the compound what it may' (Behring, Zeitschr. f. Hygiene 9, 450), can not be held.

"3. Solutions of metallic salts in which the metal exists as a part of a complex ion and in consequence of which the concentration of the ions of the metal is low, are but weak disinfectants.

"4. The action of a metallic salt does not depend alone upon the action of the ions of the metal, but also upon that of the anions and the undissociated part.

"5. The halogen compounds of mercury, including the sulphocyanides and cyanides, disinfect according to their degree of dissociation.

"6. The disinfecting power of a solution of mercuric chloride is weakened by the addition of metallic chlorides.

"7. In concentrations of 1 liter or above the strong acids act not only according to the concentration of their hydrogen ions, but also according to the specific properties of their anions. The more dilute solutions of the strong acids and those of the organic acids appear to act according to their degree of dissociation.

"8. The bases KOH, NaOH, LiOH, which are approximately dissociated to the same degree, have nearly the same disinfecting power; NH_4OH, which is much less dissociated, is a very weak disinfectant.

"9. The oxidizing agents HNO_3, $H_2Cr_2O_7$, $HClO_3$, $HMnO_4$ act according to the place they occupy in the series of oxidizing agents which has been formed on the basis of their electrical behavior. Chlorine does not fit into this series; it exerts a very strong specific action.

"10. The disinfecting power of the halogens Cl, Br, I, in accord with their usual chemical behavior, decreases with increase of atomic weight.

"11. We have been able to confirm the statement of Scheurlen that the disinfecting power of phenol solutions is increased by the addition of salts. A cause for this phenomenon could not be found from experiments thus far performed.

"12. In the case of the solutions tested, we have been able to confirm the well known fact that substances dissolved in alcohol and ether have almost no effect upon the spores of anthrax.

"13. An aqueous solution of alcohol of a certain strength increases the disinfecting power of $HgCl_2$ and $AgNO_3$."

Scheurlen and Spiro in the Münch. medic. Wochenschr., 1897, No. 4 publish an article upon the same subject. I have seen only an abstract of this article in the Pharmaceutische Centralhalle of Feb. 18, 1897. This abstract states that according to the investigations of the authors mentioned it is very probable that the efficiency of dissolved disinfectants depends upon certain ions into which the substance dissociates when dissolved. A case is mentioned where mercury as a part of a complex ion has less antiseptic action than have mercury ions. It is further stated that the addition of sodium chloride to a solution of mercuric chloride weakens the disinfecting power of the same and that the reverse is true in the case of phenols and alcohols. No reason is apparently assigned for the latter fact. It is clear that the results of these investigators are in accord with those of Paul and Krönig.

This work on antiseptics places our knowledge of this subject upon a firmer scientific basis, and certainly enables further research on disinfectants to be carried on to a better advantage.

As far as the work of Paul and Krönig or Scheurlen and Spiro is connected with the theory of electrolytic dissociation, it is simply a confirmation of the views advanced by Kahlenberg and True. The former investigators seem to have overlooked this fact entirely, for in their publications they make no mention of the earlier work of Kahlenberg and True.

The details of the researches of the last named authors must be consulted in the original article. To show that they took a broad view of the subject, covering not only the action of antiseptics but applying the new theory of solutions to their physiological action in general, the last paragraphs of their article in the Botanical Gazette are here given in conclusion.

"That the modern theory of solutions would throw light on their physiological action was to be expected. From the foregoing detailed results it is evident that in the case of plants the toxic action of solutions of electrolytes, when dissociation is practically complete, is due to the ions present. When dissociation is not complete, the undissociated parts of the electrolytes may also exert a toxic effect, as has been pointed out in several instances. We have here then, as it were, a recognition of the theory of electrolytic dissociation by the organic world.

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[5] See Botanical Gazette, August, 1896.

"It is clear that a knowledge of the mere presence of a metal or other element in a solution does not allow one to draw a conclusion as to its physiological action; it must also be known as to whether that element exists as an ion by itself or is combined with other elements to form a complex ion. If the addition of certain substances to a solution containing a physiologically active ion forms a complex ion of much less powerful action, it follows that these additional ingredients afford a means of reducing, so to speak, the physiological action of the simple ion.

"Although this work has thus far been carried out only with higher plants, investigations on bacteria that are being carried on in this connection at the Bacteriological Laboratory of the University of Wisconsin have already yielded results supporting the theory. Anyone inspecting Miquel's table of the efficiency of antiseptics in Sternberg's Manual of Bacteriology, and at the same time bearing in mind the theory of Arrhenius, although the concentrations are given in percent instead of chemical equivalents, will be able to see in it, only in rough outline to be sure, the corroboration of the views here advanced. Experiments on animals are contemplated.

"It will be seen that a wide field for research along physiological lines opens up by applying to the field of biology the dissociation theory that has proved so fertile in chemistry and physics. Further work in this direction, using the latest and best that the new physical chemistry has to offer, it is to be hoped will place our knowledge of the physiological action of solutions of electrolytes on a better basis than the purely empirical one on which it has thus far rested. It does not seem too much to expect that the effects of such study will soon be felt in agriculture and therapeutics, while bacteriological study pursued from the standpoint of the new theory will yield important additions to our knowledge of antiseptics."

University of Wisconsin, Madison.

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Medicinal Plants of Brazil.[*]

By *Dr. Theodor Peckolt of Rio de Janeiro.*

Mespilodaphne indecora Meissn. Kommt auf den Gebirgen der Staaten S. Paulo, Minas und Rio de Janeiro vor und ist unter der Volksbenennung *Canella sassafraz da serra* — Gebirgssassafras — bekannt. Es ist ein kleiner Baum mit hellbräunlichem Holze, welches nur zu Möbeln benutzt wird. Die Varietät **M. i.** var. **Canella** Meissn., im Staate Rio de Janeiro vorkommend, wird ebenfalls *Canella sassafraz* und *Paó sassafraz* benannt.

Ein grösserer Baum mit gelbbräunlichem Holz, welches zu Bauten, vorzugsweisse als Bretter benutzt wird. Sp. Gew. = 0.866. Die Rinde und das Holz haben nur schwaches Aroma. Beide werden vom Volke zu gleichen Heilzwecken benutzt wie *M. sassafras.*

Mespilodaphne pretiosa Meissn. Dieser in den Staaten Maranho͡a, Pará und Amazonas vorkommende Baum ist unter den folgenden Volksnamen bekannt: *Casca preciosa* — Kostbare Rinde; *Paó preciosa* — Kostbarer Baum; und *Casca de Maranho* — Maranhonrinde; unter den Tupistämmen als *Pereiorá* und *Amapaima.* Varietäten dieses Baumes finden sich in den Staaten S. Paulo, Minas und Rio de Janeiro, welche nicht die kolossale Grösse erreichen und welche *Canellinha* — kleiner Zimmt — benannt werden.

Es ist ein prachtvoller, bis 20 Meter hoher Baum, mit abwechelnden, lederartigen, länglichlancettlichen, etwas zugespitzten Blättern. Die Blüthentraube hat kleine, weisse, wohlriechende Blüthen. Die Beere ist länglich, bis zur Mitte von der Achse umschlossen.

Wie schon der Name besagt, ist die Rinde beim Volke und den Indianern sehr geschätzt, kommt jetzt jedoch selten in den Handel. Der Handels-

Mespilodaphne indecora Meissn. Occurs in the mountains of the states S. Paulo, Minas and Rio de Janeiro and is popularly known as *Canella sassafraz de serra* — mountain sassafras. It is a small tree with light brownish wood which is used only for furniture. The var. **Canella** Meissn. found in the state Rio de Janeiro is likewise called *Canella sassafraz* and *Paó sassafraz.*

Larger trees with yellowish-brown wood used in buildings especially as boards. Sp. grav. 0.866. The bark as well as the wood have only a faint aroma. Both are used by the people for the same medicinal purposes as *M. sassafras.*

Mespilodaphne pretiosa Meissn. This tree occurs in the states Maranho͡a, Pará and Amazonas and is known by the following popular names: *Casca preciosa,* precious bark; *Paó Preciosa,* precious tree; *Casca de Maranho,* Maranho bark; among the *Tupi* tribes it is called *Pereiorá* and *Amapaima.* Varieties of this tree are found in the states S. Paulo, Minas and Rio de Janeiro which do not attain a very great size and are called *Canellinha,* small cinnamon.

It is a very fine tree reaching a height of 20 meters, with alternate, leathery, oblong-lanceolate somewhat acuminate leaves. The floral raceme has small, white, fragrant flowers. The berry is oblong, enclosed to the middle by the axis.

As the name itself indicates, the bark is highly prized by the people and also by the Indians but is seldom seen in the market. The commercial

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[*] Continued from p. 46. Translated for the Review by Dr. R. H. True, Asst. Prof. of Pharmacognosy at the University of Wisconsin.

artikel bildet 16 bis 20 Ctm. lange und 3 bis 6 Ctm. breite, flache, 2 bis 4 Millm. dicke Stücke, mit gelblichbrauner, ziemlich glatter Epidermis, unregelmässig mit kleinen, flacherhabenen Wärzchen, besetzt. Die innere Seite ist braun, die Bastanlage grob und stark, im Bruche sehr dickfaserig. Die Rinde besitzt einen eigenthümlichen aromatischen Geruch, ähnlich einer Mischung, von Sassafras, Zimmt und Nelken. Der Geschmack ist süsslich brennend-aromatisch, etwas zimmtartig.

Die Rinde ist ein geschätztes Excitans. Die Infusion von 16 Grm. zu 160 Grm. Colatur wird Esslöffelweisse bei Nervenschwäche in Folge geschlechtlicher Ausschweifungen angewandt. Ebenso bei Leucorrhea, Oedem der unteren Extremitäten, chronischem Katarrh, Wassersucht, Gicht und Syphilis; bei einigen Affectionen wird das Absud der Rinde zu gleicher Zeit Bädern hinzugefügt.

Dr. Castro in Pará hat damit therapeutische Versuche angestellt und folgendes beobachtet: Dass anfänglich kleine Dosen verabreicht werden müssen, denn zu starke Dosen verursachen ein eigenthümlich drückendes Kopfweh und Congestionsanfälle. Bei kleinen oft wiederholten Dosen reagirt der Körper fortwährend durch gelinde Transpiration und Diurese. Besonders günstigen Erfolg hatte bei Dysenterie und Diarrhoe eine Infusion von 15 Grm. zu 300 Grm. Colatur, stündlich bis zweistündlich einen Esslöffelvoll verabreicht.

Die Indianer benutzen zu diesem Zwecke die gepulverten Beeren mit Wasser genommen.

Die Blätter haben einen schwachen zimmtähnlichen Geruch und werden von den Waldbewohnern statt indischem Thee zum täglichem Gebrauche benutzt.

Die Rinde liefert einen groben, sehr dauerhaften Faserstoff. Das sehr feste, dauerhafte, hellbräunliche Holz dient zu Bauten.

Oreodaphne rigida Meissn. Dieser in den Staaten Minas, S. Paulo und Paraná vorkommende Baum heisst volksthümlich *Canella batalha*.

Er erreicht eine Höhe von 20 bis 25 Meter und oftmals einen Durchmesser von 2 Metern. Die Rinde ist braun und rissig. Die Blätter sind steif, lederartig, elliptisch oder länglich-lancettlich, an beiden Enden kurz zugespitzt. Die mit wohlriechenden Blüthen besetzte, traubig-geästete Rispe ist endständig und achselständig. Das poröse, schmutzigweisse, leichte Holz ist nicht sehr fest, doch ungemein elastisch und verursacht beim Fällen einen eigenthümlichen Widerstand, die Schneide der Axt stumpfend. Die Holzfäller bezeichnen deshalb den Angriff auf einen solchen Baum eine Schlacht (*batalha*), daher auch die Benennung.

Das Holz wird vorzugsweise zum Sägen von Plafondbrettern benutzt. Sp. Gew. = 0.758. Die Blätter besitzten keinen Geruch während das Holz schwach sassafrasähnlich riecht. 10 Kilo lufttrockener Sägespäne lieferten bei der Destillation nur 0.993 Grm. eines mattgelblichen, dünnflüssigen, ätherischen Oeles von angenehmem Geruch, ähnlich dem einer Mischung von Lorbeer und Sassafras.

Die lufttrockenen Sägespäne lieferten folgende Bestandtheile: Wasser 19.705; ätherisches Oel 0.009; Weichharz 0.029; Harzsäure 0.022; Fett 0.015; Bitterstoff 0.056; Extract 4.739; Asche 3.0 Procent. Das hellgelbe Weichharz war von Terpenthinconsistenz. Der Geruch desselben ähnelt dem des Oeles. Es ist in Aether, Chloroform und absolutem Alcohol löslich.

Die Harzsäure ist geruch- und geschmacklos, braun, fest, verbrennt mit Flamme und schwach-

article is in the form of flat pieces 16 to 20 cm. long, 3 to 6 cm. wide and to 4 mm. thick. It has a yellowish-brown, rather smooth epidermis marked irregularly with small, flat, elevated projections. The inner side is brown, the bast region coarse and strong, fracture coarsely fibrous. The bark has a peculiar aromatic odor similar to a mixture of sassafras, cinnamon and cloves. The taste is sweetish, burning-aromatic, somewhat like cinnamon.

The bark is a valued stimulant. The infusion of 16 grm. in 160 grm. colature is given in doses of a tablespoonful for nervous weakness resulting from sexual excesses. It is used likewise in leucorrhoea, œdema of the lower extremities, chronic catarrh, dropsy, gout and syphilis. In some affections the decoction of the bark is at the same time added to baths.

Dr. Castro in Pará has made therapeutic experiments with this and obtained the following results: At the beginning, small doses must be given since too strong doses cause a peculiar, oppressive headache and congestive attacks. In small, frequently repeated doses, the body reacts by gentle perspiration and diuresis. Especially favorable results in dysentery and diarrhoea follow the administration every hour or two of a tablespoonful of an infusion consisting of 15 grm. in 300 grm. of colature.

The Indians use for this purpose the powdered berries taken with water.

The leaves have a faint, cinnamon-like odor, and are in common use among the forest inhabitants as a substitute for Indian tea.

The bark yields a coarse, very durable fibre. The very hard, durable, light brownish wood is used in buildings.

Oreodaphne rigida Meissn. This tree occurs in the states Minas, S. Paulo and Paraná and is popularly called *Canella batalha*.

It attains a height of from 20 to 25 meters and frequently a diameter of 2 meters. The bark is brown and fissured. The leaves are stiff, leathery, elliptic or oblong-lanceolate, at both ends acuminate. The branching racemose panicle of fragrant flowers is terminal and axillary. The light, porose, dirty-white wood is not very firm but is unusually elastic and offers a peculiar resistance to the chopper by dulling the ax. Wood choppers, therefore, refer to the falling of such a tree as a battle (*batalha*), hence the name.

The wood is used mainly when sawed into boards for ceilings. Sp. grav. 0.758. The leaves have no odor whereas the wood has a faint sassafras odor. 10 kilos of air-dried sawdust yielded on distillation but 0.993 grm. of a faintly yellow, thinly fluid ethereal oil similar to a mixture of laurel and sassafras.

The air-dried sawdust gave the following constituents: Water 19.705, ethereal oil 0.009, soft resin 0.029, resin acid 0.022, fat 0.015, bitter principle 0.056, extractive 4.739, ash 3.0 percent. The light yellow, soft resin was of the consistence of turpentine. The odor resembles that of the oil. It is soluble in ether, chloroform and absolute alcohol.

The resin acid is tasteless and odorless, brown, firm, burns with a flame and faint aromatic odor,

aromatischem Geruch, Asche hinterlassend. Es ist in Chloroform, Alcohol und Ammoniak löslich. Mit Natrium carbonat gekocht, löst es sich vollständig unter Entwickelung eines eigenthümlichen aromatischen, etwas terpenthinölartigen Geruches.

Das braune Fett hat Gänseschmalzconsistenz, ist geruchlos und von schwach ranzig, beissendem Geschmack. In kaltem, absolutem Alcohol ist es unlöslich, löslich in siedendem, und scheidet sich beim Erkalten heller, aber nicht krystallinisch wieder aus.

Der Bitterstoff, welcher aus der wässerigen Lösung des alcoholischen Extractes durch Fällung mit Tannin erhalten wird, ist amorph, gelblich, geruchlos und von stark bitterem Geschmack. Er ist löslich in Aetherweingeist, Alcohol und Wasser. Die Lösung reagirt neutral und giebt mit Bleisalzen keine Reaction, mit Goldchlorid, Sublimat, und Tannin aber Präcipitate.

Oreodaphne guyanensis Meissn. Dieser Baum kommt nur in den an Guyana grenzenden Theilen des Staates vor. Er hat dieselbe Volksbenennung *Cujumary* wie *Aydendron Cujumary* und soll auf gleiche Weise benutzt werden.

Oreodaphne odorata Meissn. Diese Art befindet sich in den tropischen Staaten bis Bahia und ist unter den folgenden Benennungen bekannt: *Canella mirim* — kleiner Zimmt; *Canella limão* — Limonenzimmt; und *Lauro* — Lorbeer.

Es ist ein schmächtiger Baum mit glatter Rinde und länglich-lancettlichen, stumpf zugespitzten Blättern. Die Rispen sind achselständig und tragen gelbe, wohlriechende Blüthen.

Die Rinde hat aromatischen Geruch, ähnlich dem einer Mischung von Sassafras und Citronenöl, und einen bitter gewürzhaften Geschmack. Das Decoct dient als Volksmittel bei Brustkrampf, 30 Grm. zu 500 Grm. Colatur, stündlich ein Kelchglasvoll genommen.

Das hellgelbe, seidenglänzende, etwas gemaserte Holz hat den Geruch der Rinde, nur schwächer, und dient zu inneren Bauten, besonders zu Möbeln. Sp. Gew. nach Saldauha = 0.710, nach Dr. Del Vechio 0.985.

leaving an ash. It is soluble in chloroform, alcohol and ammonia. Boiled with sodium carbonate, it dissolves completely, developing a peculiar, aromatic odor resembling somewhat turpentine oil.

The brown fat has the consistence of goose fat, is odorless and of faintly rancid, biting taste. In cold, absolute alcohol, it is insoluble, in boiling absolute alcohol it dissolves but separates out on cooling, clearer but not crystalline.

The bitter principle obtained from the aqueous solution of the alcoholic extract by precipitation with tannin, is amorphous, yellowish, odorless and has a strongly bitter taste. It is soluble in ether-alcohol, alcohol and water. The solution reacts neutral and with lead salts, gives no reaction; with gold chloride, sublimate and tannin, however, it yields precipitates.

Oreodaphne guyanensis Meissn. This tree occurs only in those parts of the state which border on Guyana. It has the same popular name, *Cujumary* as *Aydendron Cujumary*, and is used in a like manner.

Oreodaphne odorata Meissn. This species occurs in the tropical states as far as Bahia and is known under the following names: *Canella mirim* — small cinnamon; *Canella limão* — lemon cinnamon; and *Lauro* — laurel.

It is a slender tree with smooth bark and oblong-lanceolate, blunt pointed leaves. The panicles are axillary and bear fragrant yellow flowers.

The bark has an aromatic odor, similar to that of a mixture of sassafras and lemon oil and a bitter, spicy taste. The decoction is used as a folk remedy in asthma, 30 grm. to 500 grm. colature administered a wineglassful once an hour.

The light yellow, somewhat mottled wood has a silky lustre. It has the odor of the bark to a less degree and is used for interior work in buildings and especially for furniture. Sp. grav. according to Saldauha, 0.710; according to Dr. Del Vechio, 0.985.

TRANSLATIONS.

Reagents and Reactions known by the Names of their Authors.[*]

Based on the original collection by *A. Schneider,* revised and enlarged by Dr. *Julius Altschul.*

Vitali's reaction for alkaloids. The alkaloid after addition of fuming nitric acid is evaporated to dryness on the water-bath, and the residue treated with a drop of alcoholic potash. Various alkaloids show characteristic color reactions: e. g., atropine shows a violet color; strychnine with a small amount of potash, a reddish-yellow, with a larger amount, a reddish-violet color.

Vitali's reaction for blood. The suspected stain is extracted with caustic potash solution, the solution acidulated with acetic acid, and tincture of guaiac added. If no blue color appears within ½—2 hours, the addition of oil of turpentine or of oil of eucalyptus will immediately bring out that color if blood was present.

Vitali's reaction for biliary pigments. See *Gmelin's* reaction.

Vitali's reaction for chloroform. A current of hydrogen (produced from pure zinc and dilute sulphuric acid) is passed through water and is ignited at the exit-tube, which should be tipped with platinum. The flame is colorless and no color is produced by the introduction of a copper wire. If now the suspected liquid is poured into the above water, in case chloroform (or any other volatile chlorine compound) is present, the flame will turn green upon introducing the copper wire.

Vitali's test for naphthol-yellow (butter color) in the urine etc.

1. The ethereal extract of the suspected liquid is evaporated to dryness; in the presence of naphthol-yellow, the residue is colored red upon treatment with potassium cyanide solution. If the ethereal solution is shaken with caustic potash

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[*] Continued from p. 52.

solution and the latter then acidulated, woolen fibres which have been treated with alum as a mordant will be tinged yellow when dipped into the acid solution, even in the presence of only 0.000001 g. naphthol-yellow.

2. A solution of naphthol-yellow (even in urine) produces a green lake with cobaltous chloride and caustic potash.

3. The same solution when treated with stannous chloride and subsequently with ammonia, yields a white precipitate, which turns rose-red upon the addition of more ammonia.

Vogl's test for glucose. See *Mulder's* test.

Vogl's reaction for quinine. Upon treating with chlorine water and potassium ferricyanide, quinine gives a red coloration.

Vogl's reaction for chenopodium seeds in flour. Flour containing chenopodium seeds is colored rose to red upon digesting for a few hours with alcoholic hydrochloric acid.

Vry's quinine test. See *De Vry's* quinine test.

Vulpius' reaction for acetanilid. A few centigrammes of acetanilid are boiled in a test-tube with 1 cc. caustic potash solution, after which a drop of filtered chlorinated lime solution is suspended on a glass rod over the hot mixture. The drop is soon colored yellow (with a violet tinge by reflected light); upon further heating it turns violet.

Vulpius' sulphonal reaction. Upon heating sulphonal with potassium cyanide, the odor of mercaptan is developed. The fused mass yields a red color when treated with ferric chloride (sulphocyanate reaction).

Wagner's alkaloid reagent is a solution of iodine in potassium iodide (deci-normal iodine solution); it yields brown precipitates with aqueous solutions of alkaloidal salts.

Wagner-Fresenius' solution is an iodine-potassium iodide solution.

Wayne's solution for identifying glucose consists of 2 g. copper sulphate, 10 g. caustic potash, and 10 g. glycerin dissolved in 200 g. water. Glucose reduces this solution upon warming, cuprous oxide separating out.

Weber's test for blood. The suspected liquid (urine) is treated with glacial acetic acid, shaken out with ether, the ethereal layer separated and treated with old resinified oil of turpentine and a few drops of freshly prepared 10 p. c. tincture of guaiac. In the presence of blood, a blue coloration results. Compare *Almén's* reagent.

Weidel's reaction for xanthine. Upon evaporating with chlorine water and a trace of nitric acid, xanthine leaves a yellow residue which is colored a deep yellowish-red by the action of ammonia vapors.

Weigert's solutions for staining bacteria are prepared by dissolving 2—4 g. methylene blue (2 g. fuchsin or 2 g. victoria blue, respectively) in 15 ccs. alcohol, and diluting the solutions with 85 ccs. water.

Weissmann's acid mixture for dissolving iron samples consists of 10 volumes concentrated nitric acid, 2 volumes concentrated sulphuric acid and 10 volumes water.

Ulzer and *Brüll* also recommend the addition of a little concentrated hydrochloric acid while concentrating.

Welmann's reaction for vegetable fats.

Reagent: 5 g. sodium phosphomolybdate are dissolved in water, treated with concentrated nitric acid and diluted to 100 ccs.

Test: 1 cc. fat is dissolved in 5 ccs. chloroform and shaken for a minute with 2 ccs. of the reagent. In the presence of vegetable fats (cacao-butter excepted), a green color results which changes to blue upon addition of ammonia.

Wender's test for glucose. See *Neumann-Wender's* test.

Wenzel's reaction for alkaloids. These yield various colorations with a solution of 1 g. potassium permanganate in 200 g. sulphuric acid. Veratrine, e. g., yields first a light red, then an orange coloration.

Weppen's veratrine reaction. If a small quantity of veratrine is mixed with about six volumes of cane sugar and then a few drops of concentrated sulphuric acid be added, a yellow color results, changing to green and finally to blue. —*Neumann-Wender* employ instead of the sulphuric acid and cane sugar, a solution of furfurol in sulphuric acid. Morphine and codeine yield with either reagent unstable red colorations.

Weselsky's reagent is nitric acid saturated at a low temperature with nitrous acid.

Weselsky's reaction for phloroglucin. Upon adding toluidine nitrate and potassium nitrite to a phloroglucine solution, a light yellow color is first produced which gradually becomes opalescent, then orange, and finally cinnabar-red. In great dilutions the precipitate remains suspended for a long time; upon settling, the solution appears orange-red, the precipitate cinnabar-red. By means of this reaction, phloroglucine can be identified in solutions of 1:200,000.

Weyl's test for creatinin. Upon treating urine with a dilute solution of sodium nitroferricyanide and subsequently with caustic soda, it will assume, if creatinin is present, a beautiful red coloration which soon changes to yellow. The presence of other sulphur compounds interferes with the test.

Salkowsky adds acetic acid after the red color has appeared, and warms: the solution turns blue and Prussian blue separates out.

Jaffé also recommended the same test.

Wickersheimer's liquid, a preservative solution, consists of 100 g. alum, 25 g. common salt, 12 g. saltpetre, 60 g. potassium carbonate, and 20 g. arsenous acid, dissolved in 3 litres of water.

Wiederholt's reaction for pure rum and cognac. Upon treating 10 ccs. of the sample with 3 ccs. concentrated sulphuric acid (sp. gr. 1.84) and allowing the mixture to cool, the aroma of pure rum is retained, while in the case of the artificial product the aroma is destroyed.

Upon treating pure cognac with a few drops of dilute ferric chloride solution, a black precipitate is formed. Artificial cognac does not give this test; at the most, a dirt-colored precipitate slowly forms.

Wiesner's reagent for lignin is an acid solution of aniline sulphate; woody fibres are stained golden yellow by means of it, while pure cellulose is not affected. A 0.5 p. c. phloroglucine solution, which together with hydrochloric acid colors woody fibres yellow, is also known as *Wiesner's* reagent.

Wilson's reaction for nitrous acid in sulphuric acid. Add a granule of resorcin to the sulphuric acid and shake with 5 ccs. water. In the presence of nitrous acid a yellow coloration results.

Winckler's reagent. See *Mayer's reagent.*

Wolesky's test for wood fibre (in paper). 1 g. diphenylamin is dissolved in 50 ccs. alcohol and 5—6 ccs. concentrated sulphuric (or hydrochloric) acid. Depending upon the amount of wood fibre present in the paper, different intensities of orange-red will appear upon moistening with the reagent; the colorations become more prominent upon drying.

Wolff's reagent for naphthols. α- and β-naphthol dissolved in alcoholic potash yield upon heating with chloroform to 50° C., clear blue solutions, which change to red upon acidulating with hydrochloric acid. This reaction was first mentioned by *Lustgarten*.

Worm-Mueller's solution for identifying glucose is a modification of the old *Fehling's* solution. It consists of two separate solutions, viz., a 2.5 p. c. copper sulphate solution and a 4 p. c. caustic soda solution containing 10 p. c. of rochelle salt. 5 ccs. of the suspected urine on the one hand and 1—3 ccs. copper sulphate solution with 2.5 ccs. of the rochelle salt solution on the other are separately heated to boiling and then mixed without shaking.

Fehling's solution (q. v.) according to recent formulæ is also prepared and kept on hand as two separate solutions.

Wright's reaction for aconitine. If 0.001 g. aconitine is distributed through a few drops of moderately concentrated sugar solution, and then a drop of concentrated sulphuric acid is added, a rose-red zone will develop at the line of contact of the sugar solution and the acid, which color rapidly changes to a dirty violet and brown.

Wurster's modification of *Silbermann's* albumen reaction (q. v.). In place of concentrated hydrochloric acid, a mixture of this with 1/10—1/5 its volume of concentrated sulphuric acid is employed.

Wurster's "tetra"-paper for identifying ozone or hydrogen peroxide is filter-paper saturated with tetramethylparaphenylenediamine. Traces of ozone or hydrogen peroxide in neutral solutions or in solutions acidulated with acetic acid, cause an intense blue coloration of the paper. Upon boiling with alcohol the blue color disappears. Instead of the tetramethyl- the dimethyl-compound may also be employed.

Young's test for gallic in tannic acid consists in the addition of potassium cyanide, which gives a red coloration with the former, but not with the latter. According to *Stahl* this reaction can be referred entirely to the alkalinity of the potassium cyanide.

Yvon's reagent for determining the amount of alcohol in chloroform. 1 part potassium permanganate and 10 parts caustic potash are dissolved in 250 parts of water. This reagent was originally intended for testing for impurities in chloroform, on the supposition that upon shaking impure chloroform with the reagent, the violet color of the latter would be changed to green, but it was found that the prescribed alcohol content of chloroform would produce this change and the solution can therefore be employed in testing for this. Alcohol-free but impure chloroform stands the test.

Yvon's reaction for colchicine. See *Paul's* reaction.

Zacharias' reagent for albumens is acidulated potassium ferrocyanide solution and ferric chloride.

Zeisel's reaction for colchicine. Upon boiling a solution of 0.002 g. colchicine in 5 ccs. water for one to three minutes with the addition of 5—10 drops fuming hydrochloric acid and 4—6 drops ferric chloride solution (10 p. c.), the solution, originally yellow, turns olive-green and finally blackish-green. Upon shaking with chloroform in the presence of air, the chloroform assumes a ruby-red color, the aqueous solution remaining olive-green.

Ziel's solution. See *Neelsen's* solution.

Zuelzer's reaction for albumen is a zone reaction, occurring upon pouring a layer of albuminous urine upon concentrated chromic acid solution.

Zuelzer's reaction for grape sugar. A solution of cupric oxide in soda lye is reduced by grape sugar in the cold or upon gentle warming.

Zulkowsky's starch solution is prepared by heating starch with glycerin to 190°, precipitating with alcohol and dissolving the precipitate in water.

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* Arranged by Mr. R. Fischer.

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Oils, fatty (the letters following the names of the authors refer to: C, Cottonseed oil; Cac., Cacao oil; O, Olive oil; P, Peanut oil; R, Castor oil; S, Sesame oil):

Allen. Barbot O. Basoletto S. Baudouin S. Bechi C. Behrens S. Baudard. Boudet O. Brullé C, O. Cailletet. Carlinfanti S. Crace-Calvert. David. Deiss C. DiVetere R. Finkener R. Filsinger Cac. Flückiger-Behrens S. Gassend S. Geitel. Glaessner. Hager Cac. Hauchecorne C. Hehner. Heydenreich C. Holde. Hübl. Jacobsen. Köttsdorfer. Labiche C. Lewin S. Livache. Lux. Maumené. Merz O.

Meyer. Millian S, C. Poutet. Reichert-Meissl. Renard P. Roth. Royère. Schneider O. Schönvogel. Souchère P. Storch. Tocher S. Valenta. Vetere R. Villavecchia S. Welmann.

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Pilocarpine: Lenz.

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Quinine: Brand. Creuse. DeVry. Flückiger. Hesse. Herapath. Kerner. Liebig. Prollius. Schäfer. Vogel.

Quinoline: Anderson.

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Xanthine: Weidel.

Zinc: Rinnmann.

ERRATA.

Vol. 14, p. 183, C. 2, l. 3: read **biliary** for **gallic.**
“ 14, p. 202, C. 1, l. 35: read Bro**u**ardel's for Bro**n**ardel's.
“ 14, p. 202, C. 2, l. 27: read Capezz**u**oli's for Capezz**n**oli's.
“ 14, p. 202, C. 2, l. 32: read Capra**n**ika's for Capra**u**ika's.
“ 14, p. 203, C. 2, l. 9: read Cro**u**zel's for Cro**n**zel's.
“ 14, p. 204, C. 1, l. 38 et seq.: read **pus** for **mucus**.
“ 14, p. 204, C. 2, l. 10: read De**s**bassin's for De**r**bassin's.
“ 14, p. 204, C. 2, last line and on following page: read **pus** for **mucus.**
“ 14, p. 228, C. 1, l. 8 from below, and C. 2, l. 1: read E**s**bach's for E**r**bach's.
“ 14, p. 254, C. 1, l. 28: read Ha**n**stein's for Ha**nn**stein's.
“ 15, p. 12, C. 2, l. 30: read Oliv**e**r's for Oliv**ie**r's.
“ 15, p. 31, C. 1, l. 61 and 67: read Schä**ff**er's for Schä**f**er's.
“ 15, p. 31, C. 2, l. 34: read **leucine** for **brucine.**
“ 15, p. 31, C. 2, l. 35: read **leucine** for **bencine.**

MONTHLY REVIEW.

Chemistry.

Methaethyl.

A Berlin apothecary, Dr. G. F. Henning has introduced a new local anaesthetic under the above name, which is said to possess “certain” advantages over ethyl chloride. The information circulated in the German journals is exceedingly scant and unsatisfactory. “Methaethyl” would seem to be a contraction of methylethyl, a synonym for propane. The boiling point of this hydrocarbon, however, lies at —17° not at 0°, which is the boiling point of normal butane and also that of the new local anaesthetic.

[Pharm. Centrh., 38, p. 130.]

Preparation of Phosphorus by Electricity.

In an electric furnace similar to that in which calcium carbide is prepared Jondrain heats tricalcium orthophosphate with carbon. The reaction which takes place is supposed to be expressed by the following equation: $(PO_4)_2Ca_3 + 14C = P_2 + 3CaC_2 + 8CO$. The vapors of phosphorus pass off with the escaping carbonmonoxide and are condensed. The output according to this process is stated to be 80 p. c. of the theoretical yield. In addition calcium carbide is obtained for which there is considerable demand at present.

[Pharm. Ztg., 1897, p. 157; from Journ. de Pharm. et de Chim., 1897, 3.]

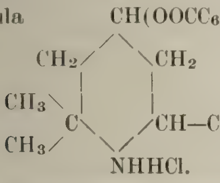
On the Occurrence of Mercury in Crude Hydrochloric Acid.

L. van Itallie again calls attention to the fact that crude hydrochloric acid, especially that coming from the Rhine Province may contain mercury. Upon testing such an acid with Bettendorf's reagent he obtained a gray precipitate, which, after the absence of arsenic had been proven by other means, was shown to be mercury. The presence of mercury in the acid is explained by the presence of this element in the iron pyrites used in the manufacture of sulphuric acid. In the process of roasting it is carried into the lead chambers. The crude chamber acid is used in the decomposition of sodium chloride and thus it is carried into the hydrochloric acid. This at least is van Itallie's explanation.

[Pharm. Ztg., 1897, p. 157; from Pharm. Weekbl. 33, No. 39.]

Eucaïne B.

According to P. Silex, eucaïne B is the hydrochloride of benzoylvinyldiacetonealkamine, the structure of which is stated to be represented by the following formula



It stands in close relation to the older eucaïne or eucaïne A and also to cocaïne and tropa cocaïne, but differs from the latter by being much less toxic. The hydrochloride in distinction to the corresponding salt of cocaïne, can be boiled indefinitely without decomposition. It can, therefore, be sterilized. At ordinary temperature a 5 p. c. aqueous solution can be prepared. This solution is neutral or but slightly alkaline. Unlike cocaïne A it is stated to irritate occular membranes but very little if at all. It is also stated to be a good anæsthetic and less poisonous than the older eucaïne.

[Pharm. Ztg. 42, p. 114; from D. Med. Wochenschr. 1897, 6.]

Cosaprine, a new Antipyretic.

The sparing solubility of antifebrine in cold water as well as its toxic properties (particularly cyanosis), and the sporadic use of sulphanilic acid in therapy has led P. Schwarz to prepare the acetyl derivative of the sodium salt of sulphanilic acid, which is characterized by its ready solubility in water.

Nietzki and Benckiser (Ber. 17, p. 708) tried to prepare this compound, but did not obtain it pure. The structural relation between antifebrine, sodium sulphanilate and cosaprine is readily shown by means of the following structural formulas:

Antifebrine — $C_6H_5.NH(CO.CH_3)$;

Sodium Sulphanilate — $C_6H_4\begin{smallmatrix}\diagup NH_2 & (1)\\ \diagdown SO_3Na & (4);\end{smallmatrix}$

Cosaprine — $C_6H_4\begin{smallmatrix}\diagup NH(CO.CH_3) & (1)\\ \diagdown SO_3Na & (4).\end{smallmatrix}$

Cosaprine constitutes a white crystalline mass readily soluble in water, sparingly in alcohol, almost insoluble in ether. Only after prolonged boiling with acids and subsequent cooling sulphanilic acid separates, acetic acid also being liberated. In the presence of alcohol the latter can be recognized as acetic ether.

[Pharm. Ztg. 42, p. 131.]

Estimation of Caffeine in Coffee and Tea.

The following method is suggested by A. Hilger and A. Juckenack. 20 g. of finely comminuted coffee or tea are soaked in 900 g. water in a beaker for several hours at the temperature of the room, and then thoroughly exhausted by boiling, replacing the water as it evaporates. For green coffee 3 hours are requisite, for roasted coffee and tea 1½ hours are sufficient for complete extraction. The mixture is then allowed to cool to 60—80°, 75 g. of *Liquor Aluminii acetici* are added and while stirring 1.9 g. sodium bicarbonate. The mixture is boiled for another five minutes, and after cooling the total weight is brought up to 1020 g. The mixture is then filtered. Of the absolutely clear filtrate, corresponding to 15 g. substance, 750 g. are taken. 10 g. of aluminium hydroxide and a magma of filter paper and water are added. The mixture is evaporated on a water-bath to dryness with occasional stirring. The residue is completely dried in a water-bath drying oven and exhausted with tetrachlorcarbon in a Soxhlet extraction apparatus for eight hours. The tetrachlorcarbon remains perfectly colorless and the pure white crystallized caffeine can be dried and weighed. The figures thus obtained can as a rule be used directly for the calculation of the percentage of caffeine. If absolutely correct results are desired the nitrogen can be determined, according to the Kjeldahl method. The tetrachlorcarbon used as a solvent should first be purified by shaking it 3—4 times with 5% soda solution and then three times with water. Finally it is dried with calcium chloride and fractionated.

[Apth. Ztg., 12, p. 145; from Forschungsber., 1897, p. 49.]

Botany and Pharmacognosy.

Electro-Germination.

Recent experiments made by A. S. Kinney on the effect of electrical stimulation on the germination and growth of seedlings, tend to show that development is hastened by such treatment. The application of an optimum current strength for short periods of time gave at the end of 24 hours 30 percent more germinated seeds than a similar untreated culture. At the end of 48 hours, 20 percent more germinations were found than in the control; at the end of 72 hours but 6 percent of difference was found. The range of current strength producing an acceleration is, however, very limited, being about 3 volts when an interrupted induced current is used. The optimum strength is practically the same for small seeds, clover, mustard, etc., and is the same for radicals and hypocotyls. It appears that an acceleration is obtained only during an early stage of development. Interrupted, indirect currents are more effective than direct currents.

[Bulletin No. 43, Hatch Experiment Station, Amherst, Mass., Jan. 1897.]

Calcium Salts, Use and Solubility.

Prof. Egidio Polacci finds calcium salts a regular constituent not only in plant ash but also in bones, in blood corpuscles, yolk of egg and in other bodies; in the latter sometimes constituting three-quarters of the total ash. The French province Lemousin was poor until the construction of modern roads permitted the cheap transportation thither of calcium salts. On many Italian soils the calcium added was more beneficial than the phosphoric acid. The author found that calcium carbonate dissolves not only in CO_2-containing water but also in water free from it provided the phosphate is already there in solution. One part of calcium carbonate demands 9662 parts of water at 12° and 9604 parts of boiling water to bring it into solution. Water saturated with CO_2 dissolves 0.709 grm. of the carbonate at 0°, 0.880 grm. at 10° and by increasing pressure as much as 3.0 grm. per liter. By boiling and introducing hydrogen, water completely freed of CO_2 dissolves at 12.5°, 9.79 mg. of calcium phosphate, rain water simply boiled at the same temperature 12.03

mg., ordinary rain water 21.63 mg., when saturated with CO_2, 60.52 mg.

[Pharm. Centralh., 38, p. 134; from Bollettino chimico farmaceutico, 1896, p. 388.]

Antitoxines.

The chapter: Summary of the therapeutics of the year 1895—96, written for the yearbook of treatment by Nestor Tirard, is introduced by the following paragraph:

"The main interest of the year has centered in the various forms of treatment with antitoxins; and evidence continues to accumulate, indicating that for diphtheria at least we possess in antitoxic serum 'a remedy of distinctly greater value than any other with which we are acquainted' (Report of the Medical Superintendents of the Metropolitan Asylums Board). The use of antitoxin for tetanus, of antivenene for snake bites, of antistreptococcus serum, and of many others, continues to attract attention, though, for the present, many are disposed to wait for further evidence of their value. The patient investigation of the claims of the serum treatment has not, however, prevented the accomplishment of a great deal of sound work, which has included in its scope a consideration of older remedies, as well as of those of more recent introduction. Experience has shown that toxic symptoms may arise from the incautious use of many drugs, and a few words of warning as to the means of minimizing risks may fitly find a place in these pages. Considerations of the victorious march of progress, even in therapeutics, should not render us unmindful of possible dangers in the ground already traversed. Sundry suggestions have been made for facilitating the employment of older remedies which have recently, perhaps, been somewhat neglected owing to the introduction of more palatable preparations. The new remedies which claim attention are not so numerous as usual, and with the exception, perhaps, of eucaine, it cannot be said that they present any striking characteristics. Many are synthetic preparations; some are recommended as antiseptics, others as soothing local applications, while others are astringent, both locally and after absorption."

[Yearbook of Treatment for 1897, p. 445.]

Rio and Cartagena Ipecac.

Dr. Albert Schneider has completed a very thorough study of the comparative anatomy of the Rio and Cartagena ipecac roots and finds differences in the starch grains sufficient to distinguish them. These characteristics are as follows:

Rio ipecac. Starch grains compound with centric hilum. Consist of two, three or four parts, each part or granule being developed from a distinct amyloplastid. The single granule shows a centric hilum of two, three or more crevices, radiating outwardly. Stratification is present, but not readily noticeable. The longest diameter of the largest single granule and of a part of the largest compound granule ranges from 6.5 to 13.5 μ. The smallest granules are 1.5 μ or less in diameter. The largest compound granules range from 17 μ to 19 μ in the longest diameter.

Cartagena ipecac. Maximum size of the single granules and the largest parts of the maximum compound granules range from 17 μ to 23 μ, a size never obtained in Rio ipecac. The large, somewhat discoid single granules are very characteristic. Single starch granules are more numerous than in the Rio root; masses of adherent grains are comparatively rare; the striation is the same; the hilum is more evident, particularly in the larger single granules; the parenchyma-cells are usually less completely filled with starch.

Dr. Schneider says ten examinations at least are necessary before concluding whether adulterations are present or not. Also a considerable quantity of material must be studied.

The vicissitudes of a changing nomenclature lead Dr. Schneider to regard the botanical name of the Rio ipecac as *Uragoga Ipecacuanha* Baill. and the Cartagena sort is assigned to *Uragoga granatensis* Baill.

[Chemist and Druggist, 50, p. 272; from Journal of Pharmacology.]

The Abnormal Formation of Resin Ducts.

Resin ducts occur normally in the wood of spruces, pines, and larches, and are normally wanting in the wood of balsams, hemlocks, and cypresses. Wood parenchyma (simple resin receptacles, Göpp), according to Kraus is present in the wood of all species of Abies. Hartig found a marked irregularity in the number and distribution of resin ducts in certain conifers that had been attacked by *Agaricus melleus*. He also found that in spruces in which so-called double rings are formed on account of late frosts, there is a striking irregularity in the formation of resin ducts in such rings. In 1892 J. Hartmann made some comparative anatomical investigations on the shoots from a "witch broom" on *Abies pectinata* and the normal shoots of the same species, in which he found that in the abnormal formation of cortex there is great irregularity in the structure and in the size, as well as a considerable increase in the number of resin receptacles. E. Mer found an abnormal formation of resin ducts in shoots of Abies sp.? as a result of the attacks of *Phoma abietina*.

We must assume that abnormal resin receptacles are present only when the plant is in part or entirely pathologically influenced. If for example resin reservoirs be found in the wood of *Abies pectinata*, they are a sure indication of some pathological condition existing in the plant. Further, with our present knowledge we must assume that resin is strictly an excretion, being of no further use in the metabolism of the plant.

These pathological conditions and the abnormal formation of resin ducts as well as other anatomical changes in the wood of diseased conifers have been studied by Alexander P. Anderson.

Three classes of pathogenic material were used in these investigations: (1) frosted conifers; (2) "witch brooms" on different species of Abies produced by the growth of *Æcidium elatinum*; and (3) tissues of conifers that had been infected with *Agaricus melleus*, *Phoma abietina*, or *Pestalozzia Hartigii*. In the first case tissues from *Pinus sylvestris*, *Picea excelsa*, and *Chamæcyparis Lawsoniana* were used.

To even briefly outline the results of the investigations along these three lines would lead too far. The reader interested in the changes produced will have to consult the original, or may be referred to the Botanical Gazette for which the abstractor has written a more detailed review of the reprint.

[Forst.-naturw. Zeitsch., 1896.]

Literary.

Books and Pamphlets Received.

Felix Alcan — Paris. Dictionnaire de Physiologie par Charles Richet, Professeur de Physioloie à la Faculté de Médecine de Paris. Tome II. 2e Fascicule: Bulle—Cerveau, pp. 321—640. 1897. Fr. 8.50.

Field Columbian Museum — Chicago. Contribution II to the coastal and plain flora of Yucatan. By Charles F. Millspaugh, M. D., Curator, Department of Botany. Botanical Series. Vol. 1, No. 3. pp. 278—341. 1896.

Lea Brothers & Co.—Philadelphia. The yearbook of treatment for 1897. A critical review for practitioners of medicine and surgery. One vol., pp. VIII, 480.

Deutsche Verlags-Anstalt—Stuttgart. Lexikon der gesammten Technik und ihrer Hilfswissenschaften. Herausgegeben von Otto Lueger im Verein mit Fachgenossen. Mit zahlreichen Abbildungen.

XVI. Abtheilung: Essigsäure—Feldpolizei, pp. 1—160;
XVII. " Feldreservoir—Fleischwarenfabrikation, pp. 161—320;
XVIII. " Fleischwolf—Gasmaschinen, pp. 321—480;
XIX. " Gasmesser—Gewehr, pp. 481—640;
XX. " Gewehrfabrikation — Grundtemperatur, pp. 641—800.
1896 und 1897. Lieferung @ M. 5.00.

Chr. Herm. Tauchnitz — Leipzig. Anatomischer Atlas der Pharmacognosie und Nahrungsmittelkunde. Von Dr. A. Tschirch und Dr. O. Oesterle. Lieferung 11. Tafeln 51 bis 55 incl. 1896. M. 1.50.

Verlag von Fr. Eugen Koehler—Gera-Untermhaus. Koehler's Neueste und wichtigste Medicinal-Pflanzen in naturgetreuen Abbildungen mit kurz erklärendem Texte. Atlas zur Pharm. Germ., Austriaca, etc., sowie zur Pharmacopœia of the United States of America. Ergänzungsband, Lieferungen 1 bis 7 incl. Lieferung @ M. 1.00.

John Wiley & Sons—New York. A handbook for farmers and dairymen. By F. W. Woll, Assistant Professor of Agricultural Chemistry, Univ. of Wis., with the assistance of well-known specialists. One vol., pp. XIV, 375.

Wilhelm Engelmann — Leipzig. Die natürlichen Pflanzenfamilien nebst ihren Gattungen und wichtigeren Arten, insbesondere den Nutzpflanzen. Unter Mitwirkung zahlreicher hervorragender Fachgelehrten herausgegeben von A. Engler, Professor der Botanik und Direktor des botanischen Gartens in Berlin. Lieferungen 141—148.

Felix Alcan — Paris. Nouveau Formulaire Magistral par A. Bouchardat, Professeur d'hygiène à la Faculté de médicine de Paris et G. Bouchardat, Professeur à l'École supérieure de pharmacie de Paris. Trente et unième édition. One vol., pp. 690. 1897. Fr. 3.50.

Friedriech Vieweg und Sohn—Braunschweig. Die Fabrikation der künstlichen Mineralwässer und anderer moussirender Getränke. Von Dr. B. Hirsch, und Dr. P. Siedler. Ein Bd., pp. XII, 393, mit 103 eingedruckten Abbildungen. Dritte, neubearbeitete Auflage. 1897. M. 8.00.

R. Gärtner's Verlagsbuchhandlung—Berlin. Chemish-technisches Repertorium. Uebersichtlicher Bericht über die neusten Erfindungen, Fortschritte und Verbesserungen auf dem Gebiete der technischen und industriellen Chemie mit Hinweis auf Maschinen, Apparate und Literatur. Herausgegeben von Dr. Emil Jacobsen. 35. Jahrgang. 1896. Zweites Halbjahr. Erste Hälfte, pp. 287—424. 1897.

Smithsonian Institution—Washington. Annual Report of the Board of Regents of the Smithsonian Institution showing the operations, expenditures, and condition of the Institution to July, 1894. One vol., pp. XL, 770. 1896.

Heinrich Haensel—Pirna a. d. Elbe. Bericht der Fabrik ätherischer Oele und Essenzen, 1896. Ein Bd., pp. 112. 1897.

——Reports on essential oils and essences, 1896. One vol. pp. 88. 1897.

Biltmore Herbarium—Biltmore, N. C. Alphabetical Catalogue of the duplicate specimens contained in the collection. Pamphlet, pp. 29.

Kolonial Museum — Haarlem. Bulletin, Maart, 1897. Brochure, pp. 73. 1897.

Reviews.

Köhler's Neueste und Wichtigste Medicinal Pflanzen in naturgetreuen Abbildungen mit kurzerklärendem Texte. Ergänzungsband zu dem in den Jahren 1883—1890 erschienenen Hauptwerke in 2 Bänden. Fr. Eugen Köhler, Gera-Untermhaus. Lieferungen 1—7. Pro Lieferung M. 1.00.

It is doubtless a source of satisfaction to all acquainted with Koehler's excellent work on medicinal plants to learn that the author has already well under way a third volume dealing with the newer drugs which seem to have taken an important and permanent place in materia medica. Seven numbers have already appeared, containing four colored plates each and a corresponding amount of text. The quality of both plates and text in the well-known two-volume work is fully sustained in the new, and, indeed, as regards the plates, seems to excel that of the preceding volumes. One frequently finds in colored plates but little satisfaction, the glaring imitations of the natural colors jarring on one's sensibilities rather than contributing to a better understanding. The plates of the work before us are not of this class, by their moderation and delicacy of tone proving a source of pleasure as well as of instruction. The text, as heretofore, is usually reduced to the necessary minimum.

To choose from among the many candidates for public favor those really most important is no easy task. The author's choice as indicated by the plates thus far at hand includes the following plants: *Palaquium Treubii* Burck, *Payena Leerii* Benth. & Hook., *Rhamnus Purshiana* D. C., *Landolphia Watsonii* H. B. K., *Palaquium Gutta* Burck, *Palaquium oblongifolium* Burck, *Nigella sativa* L., *N. damascena* L., *Delphinium Staphisagria* L., *Manihot Glaziovii* Müll. Arg., *M. utilissima* Müll. Arg., *Hevea braziliensis* Müll. Arg., *Cola acuminata* A. Br., *Hamamelis Virginiana* L., *Rubia tinctorum* L., *Calendula officinalis* L., *Carex arenaria* L., *Convallaria majalis* L., *Aretemis nobilis* L., *A. arvensis* L., *A. cotula* L., *Artemisia vulgaris* L., *Willoughbya firma* Blume, and *Urceolaria elastica* Roxb.

The great and permanent value of all of the above may be open to question, perhaps, since, with medicines as with clothes, the present fashion may change. Just now in this country the prevailing "fad" is the cola nut. When the prevailing inflation of its value has passed away, it is problematic whether its intrinsic qualities will save it from the ever-ready substitute. And the author does not seem able here to resist the temptation to depart from plain, synoptic statement but quotes the tales of the marvelous doings of negroes sustained only by a cola nut or two.

Nevertheless, we are glad of the illustrations of the plants considered and of the accompanying text, even should the drugs prove in part of but temporary significance.

The ways of the German author and publisher are sometimes inscrutable, hence no attempt will be made here to account for the order, or lack of order, in which texts and plates are appearing. We shall welcome the work as it comes to hand and when it is completed we shall use it feeling that it constitutes a genuine addition to pharmacognostical literature. *Rodney H. True.*

Otto Lueger's Lexikon der gesammten Technik und ihrer Hilfswisseschaften. Im Verein mit Fachgenossen herausgegeben. Mit zahlreichen Abbildungen. Vierter Band. Essigsäure bis Grundtemperatur. Ein Bd., pp. 800. Deutsche Verlags-Anstalt, Stuttgart und Leipzig. 1897.

This monumental work was begun as a five volume work. Under the hands of the editor and his colaborers it was soon discovered that at least seven volumes would become a necessity. The fourth volume closes with the letter G unfinished. That the motives of the publishers in this extension are the very best is sufficiently proven by the fact that anything beyond seven volumes will be delivered to subscribers free of cost. Any surprise on the part of a subscriber at such action will, no doubt, prove a happy surprise. The excellence of the work is such that one takes pleasure in cutting the pages of each new number as it makes its appearance.

As already stated on a previous occasion, this work is of great interest not alone to the engineer. It will be found exceedingly serviceable in every library, not only of institutions of learning, but in private libraries as well. Aside from the space given to engineering proper, including a fair amount of pure and applied mathematics, liberal space is given to subjects of more general interest, and of interest to specialists in other lines bordering on engineering or merely coming in touch with it at a given point.

Thus, e. g., architecture is well represented in this volume under the following headings: Etruskischer Baustil, Fachwand, Filiale, Figurenkapitäle, Gemäldegalerien, Gewölbe, Giebel, and particularly Gothischer Baustil, as well as by numerous minor articles. Aside from applied physics the general science receives its share of attention under Fernrohr, Festigkeit, Feuchtigkeit, Galvanismus, Gase, Gay-Lussacsches Gesetz, Geschwindigkeit etc. Subjects in chemistry and chemical technology are probably second in number to those in engineering. Essigsäure, Färben, Farben and Farbstoffe, Fette und fette Oele, Fichtenharz, Firnis, Flusseisen, Gärung, Gasanalyse, Gasfabrik etc., Gerbstoffe, Geschosstreibmittel, Glas — Glasmalertechnik — Glasuren, Glycerin, Gold are only a few of the more important of the very numerous subjects that might be grouped under this heading. Applied botany appears to be represented in this volume by but one larger article, viz. that on Galläpfel. Mineralogy and geology are represented by numerous minor paragraphs as well as by larger articles under the following primes: Feldspat, Gabbro, Gestein, Glimmer, Granit, Graphit. To enumerate only the longer articles under engineering proper would constitute a fair catalogue. A few of those that have been granted most space and which are more richly illustrated than any others may here be enumerated: Festungsbau, Feuerspritze, Feuerungsanlage, Flachsbrechmaschinen and Flachsspinnerei, Flussregulirung, Gasmachine, Gewehr. Law as applied to the industries is treated under Gesetzgebung, technische. The article Feldbereinigung is of economic interest as well as agricultural. That on Gefängniss borders on sociology. Agriculture, the subject of foodstuffs, fishing etc. come in for their share of attention.

This really meagre statement may give the reader some idea of the scope of the work. Engineering in all its aspects, all sciences and arts bordering on engineering come up for consideration. In this industrial age the importance of reliable information, to the specialist and to the general reader, on innumerable subjects here treated can hardly be overestimated. The very vastness of the undertaking, however, as well as the possibility of placing the same information under a variety of primes seems to make a complete index an absolute necessity. It is sincerely to be hoped that the publishers will not limit the practical utility of this magnificent work by failing to provide a complete index. *E. K.*

Dictionnaire de Physiologie. Par Charles Richet, Professeur de Physiologie à la Faculté de Médecine de Paris. Deuxième fascicule du tome II. pp. 321—640. Felix Alcan, Éditeur, Paris. 1897. Fr. 8.50.

The most prominent feature of the fascicle before us lies in several articles on subjects of physiology proper, which have been treated in a very exhaustive manner. The article on the *medulla oblongata* (bulbe), which was begun in the last fascicle and which was accorded fifty pages, receives forty-five pages more in this number. The closely related subject cerveau receives a similar liberal treatment, remaining unfinished with ninety-four pages. Other larger articles coming in for their fair share of space at least are those on capillaires; cardiographe, with a liberal number of illustrations of apparatus and curves; castration; catalepsie;

and cellule, also with a considerable number of illustrations in the text.

Chemical elements under C brought to notice in this fascicle are cadmium; calcium; carbone, with its two physiologically important oxides, carbone oxide and carbonique anhydride; and cerium. Of the nitrogen bases buxine, cadaverine and caféine may be mentioned; also camphre and caséine, organic chemicals of considerable physiological import. Under the head of physics the subject of calorimètres deserves mention and their application under the prime calorimétric animale. Applied botany or vegetable pharmacognosy are represented by cacao and café; zoology and animal pharmacognosy by cameleon and cantharides.

This fascicle also contains a larger number of minor articles. Whether the editor and publisher will succeed in crowding all they have to offer into five quarto volumes seems doubtful. If the work continues its present excellent characteristics, the addition of a sixth volume, if necessary, will not be regretted by anyone. *E. K.*

Die natürlichen Pflanzenfamilien nebst ihren Gattungen und wichtigeren Arten, insbesondere den Nutzpflanzen. Unter Mitwirkung zahlreicher hervorragender Fachgelehrten herausgegeben von A. Engler, Professor der Botanik und Direktor des botanischen Gartens in Berlin. Lief. 141—148. Verlag von Wilhelm Engelmann in Leipzig.

Mit der Lieferung 147 ist der vierte Band dieses Werkes vollendet. Die noch fehlenden Theile werden voraussichtlich in Bälde erscheinen, so dass das Werk nunmehr seiner Vollendung schnell entgegen zu schreiten scheint. Auf seinem Gebiete überall als das massgebende botanische Werk anerkannt und allgemein bekannt, bedarf dasselbe keiner weiteren Empfehlung mehr. Da mit der Vollendung des grossen Werkes der relativ billige Subscriptionspreis aufhört, ist dessen zuvorige Anschaffung rathsam.

Die vorliegenden neueren Lieferungen enthalten: Lief. 141: *Fucaceæ, Dictyotaceæ, Rhodophyceæ, Bangiaceæ, Rhodochaetaceæ, Compsopogonaceæ, Thoreaceæ, Lemaneaceæ, Helminthocladiaceæ* und *Chaetangiaceæ.* Lief. 142: *Gelidiaceæ, Acrotylaceæ, Gigastinaceæ, Rhodophyllidaceæ, Sphaerocouaceae.* Lief. 143—145: *Peridiniales, Bacillariales.* Lief. 146—147: *Labiatae.* Lief. 148: *Hysterüneae, Tuberineae, Plectascineae.*

Der mustergiltigen Ausstattung und Illustration des gesammten Werkes entsprechen auch diese Lieferungen, welche über 1000 Einzelbilder enthalten. *Fr. H.*

Anatomischer Atlas der Pharmacognosie und Nahrungsmittelkunde von Dr. A. Tschirch und Dr. O. Oesterle. Lieferung 11. Chr. Herm. Tauchnitz, Leipzig. 1896. M. 1.50.

The present number of this work is one of especial interest and value to all investigating microscopically the purity of drugs and food materials.

The various kinds of arrowroot are described from specimens seen and are excellently illustrated in accompanying plates. Under the term "arrowroot" the authors include practically all the starches of tropical origin, sago excluded. The source, geographical and botanical, the gross characteristics of the commercial article, the microscopic structure, size and behavior in use are described. In this thorough manner the following arrowroot starches are treated: West Indian arrowroot from *Maranta arundinacea* and other species of the same genus; Rio, Para or Bahia arrowroot from *Manihot utilissima* and related species; Queensland arrowroot from *Canna edulis* and its congeners; East Indian or Bombay arrowroot derived from *Curcuma* species; Tahiti arrowroot or "Tacca" starch from *Tacca pinnatifida;* Portland arrowroot from the tubers of *Arum maculatum* and allied species; Brazilian arrowroot from the tubers of *Batatas edulis* and Guyana arrowroot from the yam root, *Dioscorea* species. Banana starch, though not usually known by that name, is sometimes referred to under this last name. Sago from *Metroxylon* species is not classed among the arrowroots. Starch from germinated wheat, from the potato, horse chestnut, bean, pea, millet, buckwheat and *Lolium temulentum* are also described and figured.

The usefulness of detailed, authentic and admirably executed cuts of these starches is hardly to be overestimated.

The number continues with the usual descriptions and drawings of galangal (*Alpinia officinarum*), zedoary (*Curcuma Zedoaria*) and star anise (*Illicium verum* Hook. f). With the latter, the detailed description of the poisonous *I. religiosum* Sieb. is included, and distinguishing characteristics between the true and the false articles are brought out.

For the purposes it is meant to serve, this work leaves little to wish. *Rodney H. True.*

A handbook for farmers and dairymen. By F. W. Woll, Assistant Professor of Agricultural Chemistry, University of Wisconsin. With the assistance of well-known specialists. One vol., pp. XIV, 375, with illustrations. John Wiley & Sons, New York. 1897.

This small volume which the author has made "a compendium of useful information on farm and dairy topics" has grown out of the dairy and agricultural calendars by the same author. As its title indicates, it is written for farmers and dairymen, yet it may prove of interest and value to persons not practical farmers and dairymen, but who have an interest, probably a financial interest, in farming and dairying. This is not infrequently the case with druggists in smaller places, hence the review of an agricultural treatise in a pharmaceutical journal requires no apology.

There are, however, other points at which scientific farming and pharmacy come in touch with each other. The subject of human food materials, treated in a special chapter, is of no less importance to the pursuer of the one calling than it is to the other. Many of the tables, e. g. those on the Comparison of Fahrenheit, Centigrade and Réaumur thermometer scales, of Weights and measures, Statistical tables and others usually found in a calendar, may in the absence of a pharmaceutical calendar in the English language prove fully as valuable in the pharmacy and pharmaceutical laboratory as in the farmhouse and dairy in which intelligent work is accomplished. Although the information crowded into this small volume is not primarily intended for pharmacists, yet some members of this calling may find it of considerable interest. The book is all the more valuable on account of the cooperation of twenty-six specialists, who have contributed to it. *E. K.*

Contribution II. to the Coastal and Plain Flora of Yucatan, by Charles Frederick Millspaugh M. D. Publication 15, of Field Columbian Museum, Bot. Series, Vol. 1, No. 3, Chicago, U. S. A., December 1896.

The second paper on the Yucatan flora deals with the plant population of the northern part of the peninsula, a region peculiar in its biological characters and differing essentially from the surrounding region. "Here all the plants have a desiccated appearance due to their struggle against drought while in the neighboring areas the wealth of vegetation is marked." While all the bordering country is well watered by large streams, many of them navigable for long distances inland, the plains region has no surface water whatever. The porosity of the coralline substratum is so great that in nearly all parts the rain sinks almost immediately into the crevices and caverns below the surface. The only water supply remaining is in more or less marked surface depressions. These are of three kinds: 1) *sartenejas*, hollows with a marl-like bottom holding temporarily small quantities of water; 2) *aguadas* are merely large *sartenejas* of circular outline from 50 to 100 feet in diameter. These support a growth of mud-loving plants throughout the year. 3) *Cenotes* are deep, perpendicular-walled, nearly circular wells penetrating the floor of the plain opening into an abundant supply of clear, cold, lime-containing water. These *cenotes* are from a few feet to a hundred yards or more in diameter and contain water at a depth of from 30 to 200 feet below the level of the surrounding plain.

The brief account of the physical conditions found in the region under consideration, from which the above facts are taken, is followed by a list of plants collected chiefly by Dr. Gaumer, Sr., Porfirio Valdez and the author, Dr. Millspaugh. A small number of cryptogams were collected, among them several fungi and a *Selaginella* new to science. This contribution adds 120 genera and 272 species to our knowledge of the flora of the peninsula, of which number one genus and thirteen species are new.

To the majority, perhaps, the well known plants found offer quite as much of interest as the list of new species. Among the familiar names noted are the following: *Panicum sanguinale* L., in its usual place along the roadsides; *Portulacca oleracea* L., abundant as a weed in gardens; *Ricinus communis* L., a tree-like herb 10 to 20 feet high, cultivated and wild; *Plantago major* L., an herb 6 to 14 feet high, common on cultivated grounds; *Sambucus canadensis* L., cultivated in several places.

The new species are illustrated by good plates, those of two new fungi being colored. A map showing the principal features of the Yucatan peninsula helps to an understanding of the prevailing conditions. *Rodney H. True.*

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EDITORIAL.

In the Feb. number (p. 36) attention was called to the substitution of such meaningless terms as actrol and ictrol for silver lactate and silver citrate respectively. As far as the literature of the subject was traced it did not become apparent whether the chemical manufacturer, or the physician who first examined these antiseptics, coined these fanciful names. The chemical terms in question are certainly simple and suggestive, and there is no reason whatever except the mercenary motive lurking behind trade-marks for the coining of these new words. If manufacturers are not careful in the practice of having words registered as trademarks, the people will soon rise in rebellion not only against the abuse, but also against the legitimate use of this privilege.

At present eucalypteol is again making the rounds through pharmaceutical journals, apparently as a new remedy. It is nothing but one of the dipentene dihydrochlorides, $C_{10}H_{18}Cl_2$, prepared in this case from the eucalyptol or better, cineol, $C_{10}H_{18}O$, from eucalyptus oil. If the term dipentene dihydrochloride is too cumbersome for *fin de siècle* physicians and pharmacists, why could not a word be coined that differed from eucalyptol by more than the letter *e*? Inasmuch as eucalyptol is also used in medicine, such practice cannot be sufficiently censured. Ignorance of chemical nomenclature and desire for gain certainly ought not to be accepted as excuse for such practice. At the World's Fair at Chicago a Frenchman* went so far as to attribute different physiological properties to various specimens of dipentene dihydrochloride obtained from different oils containing cineol or limonene, each of which will yield dipentene dihydrochloride when treated with hydrochloric acid under certain conditions. Even when the chemical identity of the substances was pointed out to him, he persisted that they nevertheless were physiologically different. This reminds one of the "good old times" when ammonia prepared from clippings of fingernails from the nobility was supposed to possess special virtues over the vulgar ammonia obtained from camel's dung. That each specimen of dipentene dihydrochloride referred to above sailed under its own fanciful name, goes almost without mention.

Last month the writer took occasion to call attention to the feeling that exists in certain circles against the legitimate patenting of processes by which medicinal substances are prepared. There are no doubt several reasons to which this feeling can be attributed. One lies in the unfortunate association of the name patent with a class of secret preparations. Another reason for this feeling is to be found in the inherent injustice of some of our patent laws by means of which product as well as process is patentable, thus establishing a complete monopoly. There is also a third reason which might be designated as ethical, which is possibly not as unreasonable as the first two mentioned, but which is applied in practice with equal lack of logic by some of its most ardent supporters.

Since then the writer has received a communication from Prof. J. U. Lloyd pertaining to Ethics in pharmacy. Prof. Lloyd has spoken once before on this subject. At the Detroit meeting of the A. Ph. A. in 1888 he discussed this problem in considerable detail in his presidential address. It is a particularly opportune moment to again bring up this matter. Inasmuch as Prof. Lloyd's communication came unsolicited and without knowledge of the editorial referred to above, it is with pleasure that we are enabled to publish it *in toto*. *E. K.*

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* See this journal, vol. 11, p. 219.

Ethics in Pharmacy.

By Prof. *John Uri Lloyd.*

In our ranks we have two classes of apothecaries. One class believes in purchasing supplies and devoting time and thought to the distributing of medicines as purchased. This section of our people feel that personal attention to the sale of goods is most congenial to their taste. The second class believe in experimentation, scientific study, laboratory work and pharmaceutical manipulation. They are as a rule at a disadvantage in commercial matters as compared with their business competitors. The returns from their labor must come largely from the improvements they make in processes and discoveries in science. In my opinion, these men have not been encouraged as they should have been.

It is probably useless for me to say anything in print concerning the most vital issue connected with the welfare of the scientifically inclined apothecary, but I have no objection to expressing my views again. Useless because of the fact that my opinions are not only already well known, but because the majority of those who write on this subject and also who dominate the opinions of others are opposed to my principles.

I believe that as long as we do not have reciprocity elsewhere, the cry of socialism for the scientific pharmacist is a burning wrong to him who studies, thinks and works in pharmacy. Possibly the same pleading might be extended to the salaried professor who is paid for what he teaches, but, as I see the matter, a distinction should be drawn between him and the man who gets no personal return from instruction that enriches others. It seems to me that this distinction has never been drawn. The ethics governing men in salaried or professional positions have been applied to persons situated very differently. I do not know how I can make my words any plainer. Until a corresponding return is made to the public by other inventors, until others give the results of their brain work to competitors both at home and in Europe, I am not in favor of making American pharmacists do so. When a discovery is made in pharmacal lines that by its publication either in the patent office or in public print will not only take from the discoverer the monetary return that belongs to him that invents, but will put the profit of the inventor into the hands of competitors who have no right to this property, I am opposed to a code of ethics that advocates the wrong, notwithstanding the authority that framed the code. The reverse may be true when a rule of action is applied to the professional man, for every discovery heralded abroad adds to his credit, makes him the more conspicuous, increases his value as a teacher and redounds to the interests of the institution with which he is connected. To herald his discoveries is to serve his best interests.

Those in trade who make discoveries, by the application of science and skill that benefit mankind, should, in my opinion, either receive a personal return in the way of royalties from some responsible manufacturer, or should profit directly by their discoveries. If the discovery is of great public value, the franchise should be paid for by the public if it is turned over to the public. It is simply a case of dollars and cents and not one of sentimentality. The dollars of the millionaire inventor, the opulent merchant, the salaried professional man should contribute to the poor pharmacist if his all which is usually brain work in close business lines is to be dropped into their pockets.

In some cases the patent laws will give the inventor full protection, in others they will not do this, but quite the contrary. In some cases the trade mark or copyright laws afford better protection, but these latter schemes will not prevent others from entering the field with the same or similar preparations under other names. Neither should they do so.

I am well aware of the fact that I stand nearly alone in my views in this direction and that I have never been on the popular side. However, this fact does not concern me in the least since I believe that I am right. Some of my closest friends feel now and have always felt that I am a heretic in trade ethics, but I have seen nothing in their arguments or the results of their methods to lead me to believe that I am the sophist. Indeed, I have every reason to feel that in time to come (a long way perhaps in the future) the spirit of our code makers will rise to the fact that a great wrong has been done American chemists and American pharmacists (and largely to the advantage of Europeans) by this unqualified opposition to the personal return of him who spends his life in behalf of real pharmacy. "The laborer is worthy of his hire" and I fail to recognize any argument that excludes the scientific pharmacist from the field of labor, or any ethical axiom that should take from him his just return.

In my opinion, the burning question that the sincere advocate of just pharmacal ethics will have to meet when at last he realizes that discoveries in pharmacy should be recognized in both law and ethics, is that of unfounded pretensions in those who claim to have made pharmacal discoveries. The question will be how to differentiate between that which is possessed of merit, and impositions. As conditions are now, however, the medical profession and the public are neither spared the extravagant claims of impostors nor guided in the direction of merit. The industrious young man who devotes his all to the acquirement of an education, is placed by the side of the impostor if he protects his own interests and the public.

I must not neglect to say that I do not overlook the noble ethical works of some persons, who in theory stand quite in the clouds. They believe that the returns that come from pharmacal advancement of the individual must be free to all business men and that he who evolves in pharmacy must in public charity give the results of his labors to his business competitors, even though they are rich and powerful enough to crush him. According to these men it is wrong for a struggling pharmacist to keep a process private that he has acquired by long and expensive experimentation, and wrong for a manufacturing firm to pay him a royalty on his discovery. In the minds of these persons, and I have some very dear friends in their ranks, the pharmacist who takes advantage of the trade-mark, copyright or patent law, is unspeakably guilty. I have heard this argument, even from professional men who copyright every book they issue.

For myself, I say now as I have always said, I agree in that charity is a duty, and that it is more blessed to give than to receive. But I have felt it a duty to provide for my family, to acquire as much of an education as is possible, to try and guard against poverty in my declining years, to leave a substantial testimonial of regard to my fellow pharmacists who wish to study and work in real pharmacy, and I could not have done either of these had I permitted myself to be misled or to be drawn away from what I firmly believe is the right. The right of personal returns to individual investigations, be it in pharmacy or in any other line of science advancement, is a birthright and he who uses the legal methods for self-protection in discoveries is doing no more than justice towards himself and his family, regardless of sentimental codes of ethics that strike at the use of these privileges instead of their abuse.

These being my convictions on the most vital question that concerns the pharmacist, I cannot but favor the application of the copyright, trademark and patent laws of our country in the direction of discoveries in pharmacy. I neither understand why that franchise should be left undisturbed in the hands of outsiders who reflect no credit on our art, nor why those in pharmacy who pay their money for education, investigate, make discoveries, and protect their rights by the law that governs all other classes of business, should be classed with pretenders.

I believe that we have in our ranks a regiment of worthy men facing lost opportunities, lost because of the fact that pharmacy ethics of the past offered no inducement for the financial self-protection of meritorious workers. I believe that the blanket opposition our ethical leaders have made to the protection of meritorious discoveries in pharmacy has not only failed to elevate pharmacy, but has largely contributed to the conspicuity of impostors. At least, this inflexible code has not prevented an evil that oppresses Americans and enriches Europeans who allow no sentimental code to hold them back. Alas, I see no hope of overcoming the evil while our ethical leaders follow the foot-steps of their fathers and neither make an effort to encourage those who have something of value to offer the medical profession, nor attempt to distinguish between the true student in pharmacy and the pretender.

Believe me, my dear sir, I am fully aware of the fact that I stand alone in these views, and yet I prefer to be satisfied with myself rather than be with the majority. I prefer to give my charities according to my own judgment and to do business according to the laws of my country rather than give my rights to persons in whom I have no concern, in accordance with the views of men long since dead, none of whom have ever contended with problems that surround pharmacists now, at least, such as have confronted me. And, I will finally add that while I believe most of these extremely ethical men have been conscientious, I may be allowed to say that their bunched opinions did not in my single opinion make them right in days gone by, and neither do they make them right at present. I believe their orthodox views have never served the best interests of those unfortunate men who must make a living by scientific pharmacy; neither have they prevented impositions in medicine. Under this code the pharmacists' life has reached present conditions which might be worse, but not much.

I will close by saying that in this letter I refer only to the ethics that govern the relationship between pharmacists and physicians. I have no experience in the direction of remedies designed for popular medication or in the making of mixtures of well known drugs (secret mixtures) under fanciful titles for self-medication, and would not presume to express an opinion concerning that phase of the question.

It is but proper that as my views in this direction are heretically irregular, I should not involve others in the least. I therefore write in the first person believing that I alone see this matter in the light presented, and that I am the minority of one.

ORIGINAL CONTRIBUTIONS.

The Phenol-Content of the Oil of Monarda Fistulosa (L).

By *E. J. Melzner.*

Last summer a second report was made on the chemical composition of the oil of Wild Bergamot by the writer and Edward Kremers.* In continuing the investigation one of the prime objects was to ascertain something more about the phenol and about the phenol-content of the oil at different seasons. Another was to ascertain what the other constituents of the oil, besides carvacrol and cymene, are. For this purpose a large quantity of oil was necessary. A considerable quantity of oil was distilled last summer with the hope of doing something on both problems. The writer, however, was compelled to drop the subject after having assayed the oil and therefore makes this report on the phenol-content of this oil without taking up any of the other constituents.

The methods of estimation of the carvacrol are described on p. 199 of the volume referred to above. The volumetric estimation was made in a glass-stoppered burette which admitted of accurate reading and in which the petroleum ether† solution of the oil could be shaken repeatedly with the alkali solution until there was no further loss of volume, without having to remove the oil.

The method by titration was followed as described last year. Inasmuch as only a few oils assayed last year were assayed by titration, they were again assayed by the latter method in order to get more accurate data. The crude volumetric results of last year, the more accurate volumetric results obtained this year with the use of the burette for the purpose of measuring, and the results obtained by titration are given side by side. The column headed difference denotes the difference between the data obtained by titration in the third column and those obtained by volume in the second column. It will be seen that the difference is rather large, whereas the difference between the two modifications of estimation by volume is rather small. These data will be found in Table I.

Table I.

Sample.	Percentage of phenol by volume obt. last year.	Percentage of phenol by volume obt. this year.	Percentage of phenol by titration.	Difference.
1.	65.2 p. c.	64.0 p. c.	52.2 p. c.	11.8 p. c.
2.	67.6 p. c.	66.0 p. c.	54.4 p. c.	11.69 p. c.
3.	72.0 p. c.	72.7 p. c.	58.89 p. c.	13.81 p. c.
4.	69.6 p. c.	71.07 p. c.	61.5 p. c.	9.59 p. c.
5.	66.8 p. c.	66.07 p. c.	58.19 p. c.	7.88 p. c.
6.	67.5 p. c.	69.1 p. c.	59.2 p. c.	9.99 p. c.
7.	72.0 p. c.	71.0 p. c.	58.4 p. c.	12.6 p. c.
8.	65.5 p. c.	60.8 p. c.	52.38 p. c.	8.42 p. c.
9.	70.0 p. c.	70.6 p. c.	53.3 p. c.	17.3 p. c.
10.	64.4 p. c.	64.5 p. c.	54.4 p. c.	10.1 p. c.
12.	63.0 p. c.	60.71 p. c.	52.53 p. c.	8.18 p. c.
Average.	67.09 p. c.	66.96 p. c.	55.93 p. c.	11.01 p. c.

During the summer of 1896 weekly collections of the herb were again made. Each batch was distilled as fresh as possible and the sp. gr. of the oil was taken immediately upon distillation. Care was taken this time to weigh the herb as well as the product and thus to obtain some idea of per-

Table 2.

	When gathered.	Part of plant distilled.	Sp. gr. at temp. of room.	Weight of herb.	Weight of oil.	Percentage Yield.
1.	July 6.	Stems and leaves.	0.920, July 8.	17.62 Ko.	156.4 g.	0.88 p. c.
2.	July 13.	Stems, leaves and flowers.	0.902, July 15.	20.93 Ko.	144.32 g.	0.68 p. c.
3.	July 20.	do.	0.928, July 22.	18.31 Ko.	148.48 g.	0.81 p. c.
4.	July 27.	do.	0.930, July 29.	18.00 Ko.	158.10 g.	0.87 p. c.
5.	Aug. 3.	Stems, leaves, flowers and fruit.	0.930, Aug. 5.	19.70 Ko.	159.96 g.	0.81 p. c.
6.	Aug. 10.	do.	0.930, Aug. 12.	17.00 Ko.	156.24 g.	0.91 p. c.
7.	Aug. 17.	do.	0.930, Aug. 19.	17.00 Ko.	156.24 g.	0.91 p. c.
8.	Aug. 24.	Stems, leaves and fruit.	0.926, Aug. 26.	16.80 Ko.	142.60 g.	0.84 p. c.
9.	Aug. 31.	do.	0.931, Aug. 31.	13.10 Ko.	100.55 g.	0.76 p. c.
10.	Sept. 8.	do.	0.922, Sept. 10.	10.20 Ko.	64.54 g.	0.63 p. c.
11.	Sept. 12.	Stems and leaves.	0.930, Sept. 15.	24.00 Ko.	186.4 g.	0.77 p. c.

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* [This journal, vol. 14, p. 198. See also vol. 13, p. 207.]

† [A petroleum ether of a rather high boiling point was used.]

centage yield of oil. Inasmuch, however, as some of the herb became partly air-dried on account of the smallness of the still, the percentage yield is neither that of the fresh herb nor of the dried herb accurately considered.

The data in Table 2 are largely self-explanatory as far as any explanations can be deduced from them. Probably as our knowledge of the oil advances it may be possible to draw further conclusions. At present they may be serviceable to obtain an average within proximate limits.

The percentage of phenol in these oils was determined volumetrically with the use of the burette, which allowed of accurate reading; also titrimetrically with $\frac{N}{10}$ iodine solution. The results are given in Table 3. The minimum difference is 3.61 p. c. (No. 9), the maximum difference 17.66 p. c. (No. 4). What the cause of these variations may be, it is too early to discuss. It will be necessary, first of all, to learn more about the nonphenol constituents of the oil.

Table 3.

Number of Oil.	% of Phenol by volume. Burette readings.	% of Phenol by tituration with N|10 Iodine Solution.	Difference.
I.	62.3 p. c.	54.82 p. c.	7.48 p. c.
II.	64.6 p. c.	53.23 p. c.	11.37 p. c.
III.	65.82 p. c.	58.06 p. c.	7.76 p. c.
IV.	68.85 p. c.	51.19 p. c.	17.66 p. c.
V.	67.16 p. c.	59.69 p. c.	7.47 p. c.
VI.	62.5 p. c.	57.12 p. c.	15.38 p. c.
VII.	62.9 p. c.	57.38 p. c.	5.52 p. c.
VIII.	66.6 p. c.	56.5 p. c.	10.1 p. c.
IX.	63.63 p. c.	56.54 p. c.	7.09 p. c.
X.	61.2 p. c.	52.26 p. c.	8.94 p. c.
XI.	58.82 p. c.	55.21 p. c.	3.61 p. c.
Average.	64.03 p. c.	55.64 p. c.	9.31 p. c.

A comparison of the oils obtained in 1895 and those obtained during the corresponding period in 1896 shows that very little difference exists. The average percentage of phenol during 1895 was 66.96 p. c. (by volume) and 55.93 p. c. (by titration) respectively, whereas the corresponding figures for 1896 are 64.03 p. c. and 55.64 p. c.

In order to control the sp. gr. determinations made immediately after the oils were distilled, a second determination was made Nov. 10 of the same year with several of the oils. The results were found to be slightly higher, possibly because the temperature (20°) was slightly lower than when the first determinations were made. The results were as follows:— 0.930 (No. 1), 0.937 (No. 4), 0.933 (No. 8) and 0.934 (No. 11). The rotatory power of several of the oils was also taken in a 200 mm. tube at the same time with the following results:— $-2°58'$ (No. 2), $-2°18'$ (No. 6), and $-2°25'$ (No. 10).

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Analysis of a Liquid used for Silver Plating.

By *Edo Claassen.*

This liquid was said to be highly recommendable for the above purpose. It had a strongly alkaline reaction and contained besides potassiumsilvercyanide some potassium ferrocyanide.

For their quantitative determination 10.441 grm. of the liquid were evaporated on the water-bath, until nearly all water was gone, the remaining mixture then moistened freely with diluted sulphuric acid (1:1), dried and subjected to a somewhat stronger heat to remove the greatest part of the free acid. Extracted with water there remained a residue, which was brought into solution by melting it with potassium sulphate and then dissolving the mass in water. Both liquids were mixed, the silver precipitated by means of diluted hydrochloric acid, the silver chloride weighed after perfectly washing and heating in a porcelain crucible. Its weight was 0.091 grm., corresponding to 0.1264 grm. $KCy . AgCy = 1.2116$ percent. — The filtrate from the silver chloride was somewhat concentrated, then treated with potassium chlorate and precipitated by means of ammonia. The precipitate, after washing, drying and igniting, weighed 0.006 grm. It represented all the iron of the potassium ferrocyanide in the form of sesquioxide, corresponding to 0.0317 grm. potassium ferrocyanide

$$\left(\begin{array}{ccc} 159.68 & : & 843.64 \\ 1 \text{ Mol. } Fe_2O_3 & & 2 \text{ Mol. } K_4(CN)_6Fe \\ & & +3aq. \end{array}\right),$$

which equals 0.3036 percent.

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Some Cuban Medical Plants.

By *Robert Combs*, Asst. Prof. of Botany, Iowa State College, Ames, Iowa.

During the years of 1895 and 1896 while I was on the island of Cuba collecting botanical specimens, my attention was repeatedly called to the great number and variety of medical plants and plants used as domestic remedies. In asking information concerning common names, frequency, uses, etc. of plants that interested me, I was often told that the plant in hand was especially valuable as a remedy for "the lungs", "the stomach", "the liver", "the kidneys", or for some other portion of man's anatomy.

At first I considered these statements of the countrymen as mere ebulitions and effervescences of their over obliging natures, but later I began to be much interested in the great number of the so-called "remedios" (remedies).

I found that the country people seldom or almost never called a physician to treat their ills, the grand-mother or the mother of the family usually being so well versed in the medical virtues of the plants about her home that she could successfully combat most of the ailments of her family. And although the information that I could thus obtain was entirely empirical, I came to the conclusion that many of these "remedies" must have real medical virtues, so I began to inquire of medical authorities on the island and obtained some literature on the subject. Of this I wish to especially mention a paper, "Farmacofitologia Cubana", by Dr. Manuel Gomez de la Maza, Havana, to which work I am greatly indebted for many of the facts herein to follow.

I have arranged the plants in their natural orders according to Durand's "*Generum Phanerogamorum*", and where the plant is represented in my collection, it has been referred by number to the collection.

Dilleniaceæ.

Tetracera volubilis L. and *T. cuspidata* Mey. "Bejuco guará" and "Mantevuilla". Natives of tropical America. They are both excellent diuretics and sudorifics. Employed in intermittent fevers.

Divalla rugosa Poir. No. 713. "Bejuco colorado." Original to the Antilles and the neighboring continent. This plant is used externally in some cases of inflammation. The seeds taken internally are dangerous, being violently drastic and emetic.

Menispermaceæ.

Cissampelos Pareira L. No. 278. "Pareira brava." Antilles, Brazil, etc. It is often used against poisonous snake bites. The fruits are edible. This plant should not be confounded with *Chondodendron tomentosum* R. & Pav., which is from Peru and Brazil and furnishes the true medicinal *Pareira brava* of commerce.

Papaveraceæ.

Argemone Mexicana L. No. 485. "Cardo santo" (Blessed thistle). "Mexican or California Poppy". It is a morphine-producing plant. Its latex is yellow, turning brown on exposure to the air. The latex is corrosive and is used for warts, ulcers, conjunctivitis and chancres. It is a narcotic poison containing morphine in the leaves, root and stalk. It has been recommended in diseases of the bladder and in dermatosis. The seeds contain an oil which has purgative properties equal to those of castor oil (*Ricinus communis* L.) and according to some authors, it equals croton oil (*Croton tiglium* L.). It has also emetic properties equal to those of ipecac. They are somewhat narcotic and as such are used to ease cramp colic.

The flowers are expectorant and emetic.

The plant is a favorite empiric remedy and is used for many and varied disorders by the country people.

Bocconia frutescens L. "Palo amarillo", "Palo amarga." The latex of this plant is caustic, corroborant, vermifuge and drastic. A decoction of the root exhibits the same properties as the latex. It is used as a vermifuge and in jaundice and atonic ulcers. The oil of the seeds is sometimes used against vermin.

Guttiferæ.

Clusia rosea L. No. 501. "Copey" or "Cupey" ("Scotch attorney"). Tropical America. When the leaves or stems are broken, a yellow resin exudes which is much prized by the country folk as a vulnerary, and is said to have other properties, but I know no authority for it.

Garcinia Mangostana L. "Mangostan." The fruits, for their delicious taste and healthful effects, are considered one of the most valuable of the tropics. The epicarp is very bitter and astringent and contains a crystalline principle called mangostin ($C_{20}H_{22}O_5$). The bark of the trunk and branches is astringent and has proven itself useful in the treatment of dysentery, chronic diarrhœa, cystitis, etc. (M. Groupe, in Journal de Pharmacie et de Chemie, Paris, 1874.)

Ternstrœmiaceæ.

Several species are used empirically as astringents, but none are of special importance in Cuba. One, *Eroteum theæoides* Sw., is used instead of tea (*Thea Chinensis* L.) in Jamaica.

Malvaceæ.

Urena sinuata L. No. 46. "Escoba" and "Carapicho." The leaves and roots are emollient and pectoral.

Gossypium herbaceum L. "Algodon". Cotton is not raised to any commercial extent in Cuba, being cultivated only for domestic and medicinal uses.

The therapeutic action of cotton-root bark has long been well known. The recent infusion is considered to be the most efficacious in doses of 3—10 gm., thus used producing the characteristic intermittent uterine contractions similar to those of parturition.

The principal uses are in uterine hemorrhages and fibrous tumors and as an emmenegogue and abortive.

Gossypium Barbadense L. No. 609. "Algodon." This plant, very similar in appearance to *G. herbaceum*, is shrubby and does not yield so copiously as its congener.

It has quite a reputation in some of the West Indies as a galactagogue. A sweetened infusion of 6 to 8 leaves is taken four or five times per day without injurious effects. *Sida* species under the general name of "Malva" are used much by the country folk as emollient and pectoral. The same is true of *Malvastrum* sps. I can not say that any of them have any positive medical value, but from the number of species that were recommended to me by the peasants, I infer that there are one or two species that may be of use.

Sterculiaceæ.

Theobroma Cacao L. "Cacao." Cultivated in Cuba and is important as the plant which yields the much used pharmaceutical vehicle, cacao butter.

Malpighiaceæ.

Byrsonima spicata Cand. "Peralejo de pinares" and other members of the genus *Byrsonima* as *B. crassifolia* H. B. K. No. 16, are used as astringents in cases of dysentery. The whole plant contains much tannin. The ripe fruits are edible but when green are very astringent.

Zygophylleæ.

Tribulus maximus L. No. 33. "Abrojo." A common weed. The leaves are used to make poultices in treating skin diseases. It is also said to be corroborant and diuretic. *Tribulus cistoides* L. has the same properties and uses as *T. maximus* L.

Guiacum officinale L., "Gaïac." The wood of this tree called "Lignum vitæ" is very heavy, having a specific gravity of 1.3. The tree furnishes the guaiac chips and guaiac resin of our drug trade so widely known and used for their general alterative effects. The various constituents, properties and uses are so generally known that they need no discussion here.

Rutaceæ.

Xanthoxylum Clava-Herculis L. No. 376. "Ayuda." The plant has an acrid, bitter taste and is astringent, sialagogue, sudorific, (possessing these properties to a greater extent than does "*Jaborandi*"), diuretic, emmenagogue and doubtfully corroborant. The plant yields a volatile oil which is found in oil glands in all the younger parts of the tree and which gives the tree a very aromatic odor. It contains also a fixed oil, gum resin, tannin, an active principle called xanthopicrin (identical with berberine) and xanthoxylin, a special crystalline principle which quickly produces general paralysis, causing cessation of respiration and circulation in frogs and rabbits.[1] The leaves are considered vulnerary. The bark in various preparations is used in intermittent fevers, dropsy, dyspepsia, diarrhœa, dysentery, syphilis and other diseases.

X. aromaticum Willd., possesses similar properties and uses.

One or two other Cuban members of the genus *Xanthoxylum* are considered medicinal as *X. ternatum* Sw., and *X. emarginatum* Sw. The bark is astringent and is employed in the treatment of gout and syphilis.

Citrus aurantium L. var. *spinosissima* Mey. No. 137. "Limon sylvestre." Said to be original to the Antilles. It grows commonly in a wild state, but the fruits, similar in appearance though smaller than the common lemon (*Citrus Limonum* Riss.) have all the properties and uses of that fruit. It is called "native lemon" while the other is called "French lemon."

Simarubaceæ,

Picramnia pentandra Sw. No. 316. "Aguedita" or "Quina del Pais" (Native Quinine). This plant is considered an excellent substitute for quinine, by the country folks and insurgent soldiers by whom it is much used in the treatment of intermittent fevers, dysentery and cholera.

Dr. Juan Casanova, U. S. vice-consul at Cienfuegos, first called my attention to the plant and its uses. He told me that during the rebellion of 1868—'78, the insurgents would hide away in unhealthful regions, almost deadly to Spaniards, and remain there with impunity, and claimed that this was made possible by the great use that the insurgents made of "Aguedita." Dr. Casanova as an experienced physician claims it to be a worthy substitute for quinine. An article was published several years ago on the subject of "Aguedita",[2] but I have not seen it.

A congener (*Picramnia ciliata* Benth. and Hook.) is used as a febrifuge, while still another (*P. antidesma* Sw.) is used as an astringent and antisyphilitic.

Picrodendron arboreum Planch., (*P. juglans* Gr.) No. 646. "Ganilla." A bitter plant, used as a sudorific refrigerant, purgative and rubifacient. It is also used in venereal diseases.

Other medicinal plants of this order are: *Quassia amara* L., cultivated in Cuba, *Quassia Cedron* B. & H., of Colombia, Venezuela, Costa Rica, etc., *Simaruba glauca* Cand., and *Simaruba officinalis*, all of which are effective febrifuges.

Burseraceæ.

Bursera gummifera L. No. 486. "Almacigo." This tree is well known to the pharmaceutical world for its gum resin, but it seems not to be appreciated in Cuba as a medicinal plant.

It is much used however for posts, the resin contained preserving them well. Besides this the tree is so hardy, the posts made of the poles often give out roots and leaves and grow, making living posts.

Meliaceæ.

Swietenia Mahagoni L. "Caoba." This tree is known throughout the world as the producer of the beautiful mahogany wood, used so extensively for cabinet purposes. It grows in abundance on the lower hills along the coast and the cutting and shipping of mahogany timber is quite an extensive industry. Besides its technical value it is considered as having a medicinal use. The bark of the tree is a bitter astringent, corroborant, febrifuge, antiseptic and antidysenteric. The seeds contain an oil.

Guarea trichilioides L. No. 49. "Yamoa." "Gamoa" has energetic properties as purgative emetic, emmenagogue, and a powerful abortive. Its poisonous effects are analogous to those of "Manzanillo" (*Hippomane Manzinella* L.).

It is administered in the form of a decoction of the bark of the root, as this preparation seems to lack its dangerous properties.

The milky juice (latex) of the green plant is also used, 3—5 drops being taken in a potion. It has been recommended in syphilis, but it should be used with great precaution and as a last recourse.

Trichilia Havannensis Jacq. No. 348. "Ciguaraya." A decoction of the leaves is used in baths as a general antiarthritic.

It has been recommended in some cases of jaundice and dropsy, various diseases of the liver and spleen, and in syphilis. The species is one of the many plants that has been considered by the empiric as a "rejuvenator of man" in cases of sterility.

Trichilia trifoliata Jacq. "Cerezo Macho." Cultivated in Cuba. This very dangerous plant is much or almost always used for a criminal purpose and often with fatal results. It is one of the most powerful emmenagogues, both its leaves and flowers readily producing abortion and often death with great pain and terrible suffering. The root is purgative as well as abortive.

Celastrineæ.

Myginda Rhacoma Sw. Nos. 452 and 456. This species and three other members of the genus, *M. uragoga* Jacq., *M. latifolia* Sw., and *M. pallens* Sm., are all efficient diuretics.

Sapindaceæ.

Euphoria Longana Lam. "Longán." Cultivated in Cuba, from China. Fruits have a winy taste and are refrigerant.

Nephelium lappaceum L. "Rambustán." Cultivated, from India. Its fruits are pulpy, sweet and edible, seeds narcotic, bitter,

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[1] Heckel and Schlagdenhauffen, "Academie de Sciences", Paris, Apr. 21, 1884.

[2] "Annales de la Real Academia de Ciencias de la Habana."

Nephelium Lit-chi Camb. "Litchi." Cultivated in the Antilles from tropical Asia. Its fruit is sweet, rather acid, refrigerant and pectoral. Used to make refreshing adjuvenant drinks in treating slow fevers.

Anacardiaceae.

Mangifera Indica L. "Mango." No. 695. A native of India, but is cultivated in nearly all tropical countries. Naturalized in the West Indies where it is a much prized fruit.

Much has been written concerning its medicinal value and very varied properties and uses have been claimed for it, but there is much lack of scientific verifications. Howe and other authors claim that it is useful in catarrh, diphtheria, pulmonary tuberculosis, bronchitis, intestinal and uterine hemorrhages, diarrhœa, leucorrhœa and nephritis, considerably decreasing the albumen in the urine in certain cases of albuminuria, but without any especial therapeutic action accompanying the decrease. Its principal pharmaceutical preparation is the fluid extract; dose 15—30 drops.

Anacardium occidentale L. No. 310. (Cashew tree.) Common throughout the West Indies and naturalized in all tropical countries. Its oily fruits are edible.

Spondias lutea L. No. 24. "Jobo." A large tree whose beautiful yellow fruits are often eaten although claimed to be injurious by some. They are very acid and have an excellent flavor.

Spondias purpurea L. No. 722. A low, spreading tree, blossoming in winter. The fruits are well developed before the leaves are put forth in May. It is a fruit much prized by the country people.

Comocladia dentata Jacq. No. 712. "Guao." Common in savannahs. This shrub much resembles our innocent sumach (*Rhus glabra*) in appearance, but it possesses all the poisonous effects of poison ivy (*Rhus toxicodendron*) as far as *Rhus* poisoning is concerned at any rate. It is said by the natives to be very poisonous when taken internally, but I have no scientific authority at hand. The plant when disturbed gives off an odor very similar to that of a skunk. The milky juice when applied to the skin is caustic, producing a black spot slowly turning to an inflamed blister lasting from 6 to 10 days before healing.

This juice is milky in color when it first exudes, but quickly turns brown and then black upon exposure to the air.

It is often used as an indelible ink and is very good for marking linen.

Moringeae.

Moringa pterygosperma Gaertn. No. 177. "Ben," "Paraiso frances." Cultivated in Cuba from tropical Asia. Dr. Gomez de la Maza reports an analysis or examination[3] that he made of the oil of the seed or nut. ("Aceite de Ben.")

A portion of the oil does not become rancid and has about the consistence of vaseline. He recommends this portion as a laxative for infantile patients.

Leguminosae.

Acacia Farnesiana Willd. No. 448. "Aromo Amarillo," "Cují." Occurs in nearly all tropical countries and is cultivated in the temperate zone.

A gum exudes from the bark.

The legumes are used in some degree in tanneries for the little tannin they contain. Infusions and decoctions are made of the legumes, used in the treatment of inflammations of the skin, eyes and throat. An aqueous distillation of the flowers gives a volatile oil of slight odor and marked corroborant and antispasmodic properties, much used in gastralgia.

By alcoholic distillation an elegant perfume is obtained.

Cæsalpinia echinata Lam. "Palo de Brazil." Cultivated in Cuba. This plant furnishes the wood called in Cuba, "Brazil wood", very much used by dyers. It contains a coloring principal called Brasilin, $C_{22}H_{20}O_7$, which when subjected to dry distillation, at a temperature of 130° C., yields resorcin (Metadioxybenzol), $C_6H_6O_2$, which has all the properties of resorcin of benzene origin.

Cæsalpinia bijuga Sw. No. 455. "Guacamaya de Costa." Common in tropical countries. The bark of this tree (old trees, 25 years old) is used by dyers for the tannin it contains.

Cæsalpinia pauciflora B. & H. No. 97. This species is also utilized for the tannin that it contains.

Cæsalpinia pinnata Sauval. and *C. coriaria* Willd. Both known by the common name of "Dibidibí." Their legumes contain much tannin, which makes an excellent black dye, used much by dyers. The tannin of the latter species differs from that of nutgalls. It also contains gallic acid. A great deal of "Dibidibí" is exported to Europe from South America, but I can not say to what extent the industry exists in Cuba.

Cæsalpinia pulcherrima Sw. No. 629. "Guacamaya." Original to India, but is cultivated and naturalized in most tropical countries. Used very much as a decorative plant, its red flowers being considered very beautiful.

The leaves are corroborant and emmenagogue to the extent of producing abortion.

The leaves and flowers are both used in the treatment of intermittent fevers.

The root is acrid and said to be toxic.

Cæsalpinia adnata G. M. (*Peltophorum adnatum* Gr.). "Moruro abey." Endemic in Cuba. The plant is astringent, its bark and leaves being much used by peasant woman in the form of a decoction to contract the vagina in order to simulate youth and virginity. This is said to be an extensive practice in Brazil, other leguminous astringents (*Acacia* and *Mimosa*) being also used, where they are called by the significant name of "Corteza de joventud y de virgindad" ("Youth and virginity bark").

Pœppigia procera Presl. No. 322. "Pengue." The tannin that this tree contains is utilized in various ways, among other uses is that of vaginal contractor by the peasants, similar to *Cæsalpinia adnata* G. M. A decoction of the bark has been recommended for erysipelas, but does not produce favorable results.

Abrus precatorius L. "Peonia de St. Thomas." Native to India. Naturalized in Cuba, etc. The beautiful red beans of this plant are widely used under the name of jequerity beans, the infusion of which is so renowned for its production of granulations in the treatment of conjunctivitis.

It has also been used in the form of a thick paste-like emulsion (Dr. Schoemaker, Philadelphia), in cases of epithelioma, lupus and gangrenous ulcers with very good results.

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[3] "Revista Eciclopedia" Havana, 1886, No. 4.

Some authors claim that jequerity owes its properties to an active principal which it contains, called jequeritin, while others claim that the bean itself has no action and accredit all the therapeutic value of the infusion to a bacillus isolated and described by Sattler, which is found in the infusion of the bean. However, be this as it may, jequerity infusion is a most valuable remedy.

Piscidia Erythrina L. "Guamá hediondo." (Called "Dog Wood" in Jamaica.) Original to Mexico, Florida and Antilles. The bark of the root is a valuable nervous sedative, having an advantage over opium in not producing dullness, stupor and constipation. Dr. Ott of Philadelphia claims the extract of *Piscidia* is narcotic, dilating the pupils and reducing the pulsations of the heart. It retards the respiration and in large doses produces general paralysis, causing death by asphyxia. It is also sudorific and sialagogue, in all, has a general action similar to morphine. It is used as a hypnotic and in treating neuralgias of various kinds. (To be continued.)

Koch's New Discoveries on Tuberculosis.

By Prof. *H. L. Russell.*

Six years ago, Robt. Koch announced to the medical world, and it was soon heralded far and wide, that he had discovered a new cure for consumption. The reputation of its discoverer gave it a prestige that does not usually accrue to the frequent consumption cures of the present day.

Hundreds of patients in all stages of the disease journeyed to Berlin, even in the dead of winter, to grasp at this last hope that was held out to their relief. Much misconception concerning its efficiency existed. Koch himself was never as positive as many of his friends, and while the treatment of infected animals with tuberculin was eminently successful, the application of the method to the diseased human being did not meet with the measure of success that was expected, although in numerous cases where the disease existed in the incipient form, it arrested the disease processes and in many cases complete cures were effected.

As a diagnostic agent, especially in the bovine form of the disease, the original tuberculin of Koch has been a great success. It, however, contains certain irritating principles that are undesirable, and Koch's efforts for the last six years have been continually directed toward the preparation of a product that would be free from all these properties but which would contain the necessary immunizing substances. It seems as if success has at last crowned his efforts. The Deutsche Med. Wochenschrift of April 3rd, 1897 contains an account of these new discoveries with reference to tuberculosis.

From his observations Koch concluded that the affected patient gradually acquired a degree of immunity by reason of the disease. There occurs a stage in which the tubercle bacilli are very plenty, but in the course of time these often disappear. This immunizing stage, however, occurs too late in the course of the disease to be of any service to the patient, but if it could be artificially produced at an earlier date, he thought it might enable the patient to check the progress of the malady. Koch conceived that this immunizing process must be due to the reabsorption of certain constituents of the bacilli themselves.

The remarkable resisting properties of the tubercle bacillus, Koch had previously determined to be due to the presence of certain fatty acids that form a layer around the body of the bacillus. Rather than to use strong chemical agents that would break up these and other compounds, and thus render possible the absorption of the essential immunizing substance, he dries highly virulent tubercle cultures thoroughly, then triturates them in an agate mortar. In this way he ruptures the organism, thus permitting the extraction of the soluble constituents from the finely comminuted mass. This fluid is then centrifuged. The first extract obtained is a slightly opalescent fluid which he calls tuberculin O (TO). The sediment in the centrifuge is then dried, and digested with water and again centrifuged. This is continued until the water is perfectly clear. These later extracts contain the essential immunizing principle which he calls Tuberculin R (TR). TO contains mainly those elements soluble in glycerin; therefore, it is similar to the original tuberculin of 1890, while TR is insoluble in glycerin.

The introduction of TR in large doses into tuberculous patients produces a reaction, but if the initial dose is very small (1/500 mg.), usually no effect is observed. If the patient is injected once in two days with gradually increasing doses, he soon becomes immunized against large doses. Koch continues the administration of the tuberculin until a dosage of twenty mgr. is reached. If no reaction follows, immunity in the course of a short time is complete.

Guinea pigs infected with the disease can only be cured where the treatment is begun soon after infection (1—2 weeks). But little hope is offered to those persons in the advanced stage of the disease, especially where secondary infection of a septic nature has occurred. Where the body temperature is above 100 degrees F., this treatment is only occasionally of value. Koch has already treated a large number of patients affected with consumption of the lungs as well as lupus with very favorable results. He refrains, however, from pronouncing these cases entirely cured as not sufficient time has elapsed to definitely determine this point, but the application of the tuberculin has almost invariably been followed by a reduction in temperature, increase in weight, and a gradual but steady improvement in symptoms and general condition.

As the tuberculin is prepared by grinding, in a dried form, the deadly tubercle bacilli, the process of manufacture is fraught with considerable danger. The Farbwerke at Hoechst am Main, where Behring's Diphtheria antitoxin is prepared, have been entrusted with the preparation of the material.

The medical world will await with intense interest confirmation of this report, and it is sincerely to be hoped that the long continued labors of this Great Master of Bacteriological science will be finally crowned with success. Koch's name is so indissolubly linked with the discovery of the cause of consumption that a successful method would triumphantly crown his labors.

The closing decade of the nineteenth century is indeed yielding rich fruitage in the advances that have been made in the healing art, more particularly in the application of bacteriological science to the prevention and cure of contagious diseases.

The Univ. of Wis., Agrl. Expt. Station.

MONTHLY REVIEW.

Chemistry.

Morphine-methyl Hydroxide.

E. Vongerichten compares this compound with the known phenolbetaïnes and converts it into codeine-methyl iodide and methyl morphimethine.

[Berichte, 30, p. 354.]

The Digitalin Reaction.

A. Beitter shows that the Keller-Kiliani reaction for digitalin is also produced by cinchotannic acid. A positive result with the Keller-Kiliani reagent is therefore not positive proof of the presence of digitalin.

[Arch. f. Pharm. 235, p. 137.]

On the Constituents of Black and White Mustard.

J. Gadamer has made a report of over seventy pages full of experimental data. The author does not consider his investigation as concluded. Inasmuch as it would be difficult to give an adequate idea of the article in an abstract, the original will have to be consulted by those interested. [Arch. f. Pharm. 235, p. 44.]

Periplocin.

According to the report of Zimmer & Co. periplocin is a crystalline glucoside, $C_{30}H_{48}O_{12}$, which has been isolated by Lehmann and Burschinsky from the Indian "Hundswinde", *Periploca græca.* It melts at 205°, is readily soluble in alcohol, difficultly in ether. In cold water it is more readily soluble than in hot. It is a powerful heart-poison possessing great similarity in this respect to digitalin, strophantin and quabaïn and deserves to be examined as to its medicinal value.

[Zeitsch. d. allg. oester. Aptver., 1897.]

Dourahinha or Folia Palicoureæ rigidæ H. B. K.

This Brazilian drug was examined chemically and more specially pharmacologically by C. G. Santesson. He obtained a poisonous basic substance, douradine, which may possibly be identical with the palicourine of Peckolt. The solution of another even more poisonous substance, possibly an acid, was also experimented with.

The drug itself is described by Elfstrand as a diuretic and diaphoretic and is said to act on the heart similarly to digitalin. [Arch. f. Pharm. 235, p. 143.]

Nux Vomica and Ignatius Bean.

An examination of several constituents of these two drugs was made by G. Sander. I. He shows that igasuric acid from both is identical and that it is caffeotannic acid yielding upon hydrolysis with potassa a sugar and caffeic acid. II. The various methods of assay are reviewed and criticized. The gravimetric method of C. C. Keller is considered the best and some slight modifications are tried and suggested. III. The methods of separation of strychnine and brucine are discussed. The author is of the opinion that the two alkaloids are present in the drugs in a simple and constant ratio.

[Arch. f. Pharm. 235, p. 133.]

The Application of Potassium-Bismuth-Iodide in the Isolation of Organic Bases.

E. Jahns discusses the use of this Dragendorff's and Kraut's reagent for the purpose of isolating organic bases from plant extracts. To the list of occurrences of choline in plants given by Kunz-Krause in his translation of Guareschi's work on alkaloids he adds the following:—Chamomile flowers, millfoil, melilot, malva leaves, *Herb. Cochleariæ*, anise, elder bark, seeds of false acacia. The bursine of Bombelon obtained from the shepherds purse is identical with choline. In small quantities (up to 0.2 p. c.) it is found together with less betaine in the seeds of *Lathyrus sativus* and *L. Cicera.*

[Arch. f. Pharm. 235, p. 151.]

Asparaginic Acid.

Based on the observations of Becker (Ber. 14, p. 1035), Landolt (Ber. 13, p. 2334) has pronounced asparaginic acid obtained from l-asparagine laevogyrate. Piutti, (Ber. 19, p. 1691), on the other hand, found it to be dextrogyrate and Marshall (J. C. S., 69, p. 1022), has recently verified this observation. The statement of Pasteur that the solution of asparaginic acid to which acid has been added is dextrogyrate, and that the alkaline solution is laevogyrate has never been contradicted.

Ellen P. Cook at the request of Prof. Landolt has recently gone over the field and concludes that Becker's acid probably was not totally free from alkali. A single drop of soda solution is sufficient to change the angle rotation. [Berichte, 30, p. 294.]

Physosterine.

After giving Hesse's definition of physosterine and reviewing the history of the vegetable cholesterines, H. Thoms reports on the results obtained by the application of Liebermann's and Hesse's reactions to 1) cholesterin from gall-stones, to 2) phytosterin from cottonseed oil, 3) from grass leaves and 4) from belladonna leaves, 5) β-amyrin, 6) cinchol, 7) onocol, 8) onoketone, 9) resin acid from onoketone, 10) abietic acid, 11) benzo-resinol.

It is pointed out that the so-called cholesterin reaction cannot be due to the alcoholic character of this class of substances. Phytosterines are defined temporarily as those high molecular, unsaturated alcohols of the vegetable kingdom which give color reactions like those or similar to those of cholesterin, and whose formation is caused by like physiological processes in the vegetable organism.

[Arch. f. Pharm. 235, p. 39.]

Onocerin or Onocol from Ononis Spinosa.

Besides the glucoside ononin and other substances the root of *Ononis spinosa* L. contains a compound onocerin isolated by Hlasiwetz in 1855. According to H. Thoms this substance is a di-secondary alcohol of the formula $C_{26}H_{42}(OH)_2$, melting at 232°. It yields a diacetyl and a dibenzoyl derivative. The name onocerin, which suggests a wax of ester-like composition, should be replaced by the name onocrol indicative of its alcohol character.

Upon oxidation with chromic acid mixture it yields a crystalline diketone melting at 186—187°. This onoketone has the composition $C_{26}H_{40}O_2$. Its di-ketone character was determined by the hydrazone, $C_{26}H_{40}(N.NHC_6H_5)_2$, the ketoxime, $C_{26}H_{40}(NOH)_2$, and the semicarbazone, $C_{26}H_{40}O.N.NH.CO.NH_2$.

Upon further oxidation butyric acid, acetic acid, an acid of the composition $C_{20}H_{38}O_2$ and a monobasic resin acid $C_{20}H_{30}O_5$ were obtained. The formula, $C_{19}H_{29}.CO.CH_2.CO.CH_2.CH_2.CH_2.CH_3$, is to partially express the structure of the onoketone.

[Arch. f. Pharm. 235, p. 28.]

Picrotoxinin.

The fruit of *Anamista cocculus* contains a bitter principle, picrotoxin, which is a powerful poison. It has been shown by several authors that the picrotoxin of commerce is no simple substance, but a mixture. From it a pure picrotoxin, melting at 199 to 200°, can be obtained. This picrotoxin can be resolved into picrotoxinin and picrotin by prolonged boiling with benzene or chloroform. E. Schmidt supposes picrotoxin to be a chemical unit, whereas others regard it as a mixture evidently of definite composition, which is compared to a "solid solution". R. J. Meyer has recently investigated this controverted problem. He finds that the molecular weight of picrotoxin is but one-third of what it ought to be if Schmidt's formula $C_{30}H_{34}O_{13}$ is taken to be correct. He also obtains according to different methods only 34 p. c. of picrotin. Synthetically he obtains picrotoxin from the hot aqueous solution of two molecules of picrotoxinin and one molecule of picrotin. On the method of separation of the two compounds by means of strychnine or brucine the author expects to report more fully later, also on several of their derivatives.

[Ber. d. pharm. Gesellsch. 7, p. 16.]

Caffeïdine carbonic acid.

According to Malz and Andreasch (Monatsh. f. Chem. 4, p. 369) caffeine can be converted into caffeine-carbonic acid when treated with dilute alkali. When heated its solution is decomposed into carbon dioxide and caffeïdine. E. Fisher and O. Bromberg recently tried to reverse these reactions. Caffeïdine carbonic acid can be reconverted into caffeïne when heated with phosphorus oxychloride, but an attempt to introduce carbonic acid into caffeïdine was not successful.

[Berichte, 30, p. 219.]

Sparteïne.

Sparteïne when oxidized yields a number of oxydation products of which oxysparteïne, $C_{15}H_{24}N_2O$ (Ber. 24, 1095), and dioxsparteïne, $C_{15}H_{26}N_2O_2$ (Ber. 20, 2219 and 25, 3609) are of special importance. The nature of the oxygen atoms that have entered during the process of oxidation is of interest as indicated e. g. by the physiological properties of the two oxycompounds. Oxysparteïne produces an increase in the heart activity. Although the pulse beats less the work of each beat and the sum total of the work is increased in most cases. Dioxysparteïne, on the other hand, has an inverse effect upon the heart.

Chemical investigation by Felix B. Ahrens has shown that the oxysparteïne contains an aldehyde group and the dioxysparteïne contains two hydroxy groups. The experiments upon which their conclusions are based can best be obtained in the original.

[Berichte, 30, p. 195.]

Curcumin.

Ciamician and Silber have taken up the investigation of this interesting coloring matter where Jackson and Menke have left off. According to Zeisel's method they proved the presence of two methoxy groups, assigning to the compound the formula $C_{21}H_{20}O_6 = C_{19}H_{14}O_4(OCH_3)_2$ whereas J. and M. found but one methoxy group. A diacetyl derivative is also prepared to which the formula $C_{19}H_{12}O_2(OCH_3)_2(OC_2H_3O)_2$ is assigned. Dimethylcurcumin was also prepared. Furthermore, condensation products with hydroxylamine and phenylhydrazine were obtained, the exact nature of which is not yet known.

[Berichte, 30. p. 192.]

Camphor.

Camphor and its derivatives have recently come in for their full share of investigation as indicated by the following titles:—

Ferd. Tiemann contributes several papers on this subject describing a number of derivatives.

Second contribution (p. 242).

In the third contribution (p. 321) principally nitrogen derivatives come up for consideration.

In the fourth contribution (p. 404), dihydro- and other compounds of this group are reported on.

[Berichte, 30, pp. 242, 321 & 404.]

The Oxydation Products of Camphoric Acid.

L. Balbiano reports on an acid $C_8H_{12}O_5$, the principal product of oxidation resulting when camphoric acid is oxidized in alkaline solution with potassium permanganate. [Berichte, 30, p. 289.]

Campholene.

Based on a number of experiments made by himself and others Ferd. Thiemann assumes that campholene is a tetramethyl derivative of a ring with five members and that upon rearrangement it is converted into a tetrahydropseudocumedene. [Berichte, 30, p. 594.]

On the Oil of Levisticum officinale.

The oil from the root of this plant, which had not been examined chemically previously, was made the subject of an investigation by R. Braun. He isolated the following substances:—

I. A compound $C_{10}H_{18}O$ resembling cineol, but no crystalline derivatives with the hydrohalogen acids were obtained.

II. A compound $C_{10}H_{16}$ resembling limonene, but not identified as such.

III. Isovalerianic acid.

IV. Acetic acid obtained as an oxidation product.

V. Benzoic acid.

[Arch. f. Pharm. 235, p. 1.]

Odorless Turpentine Oil.

It is supposed that the odor of turpentine oil is not due to its principal constituent, pinene, but to an oxydation product of this hydrocarbon. This oxydation product is supposed to be an aldehyde, probably $C_{10}H_{16}O_3$, and to it the strong odor of ordinary turpentine oil is said to be due. It is generally known that upon rectification with water vapor, especially after the oil has been shaken with lime water or milk of lime, the oil assumes a much more pleasant odor. However, the amount of aldehyde is said never to exceed one percent, because it soon condenses with the elimination of water forming resinous substances, thus causing the thickening or resinification of the oil. E. von Szigethy has recently obtained an odorless turpentine oil by rectification in partial vacuum (12 mm.) or rather in a rarified atmosphere of carbon dioxide. Szigethy claims that the odor of turpentine oil is due only to the oxidizing influence of the air.

[Neueste Erfahrungen und Erfindungen, 24, p. 173.]

Adulteration of Anise Oil.

The oils from anise and fennel have at least one constituent in common, viz. anethol, by means of which the quality of both oils are largely judged in commerce. The chemists of Schimmel & Co. have found that the stearoptene of fennel oil is used for the adulteration of anise oil. The observations made for years indicate that anise oil is always slightly lævogyrate (up to $-1°50'$), fennel oil is strongly dextrogyrate. Inasmuch as the fennel stearopten not only contains anethol but usually the dextrogyrate fenchone, the addition of such stearoptene to anise oil materially affects the rotatory power of the latter.

[Bericht Schimmel & Co., April 1897, p. 5.]

Chemical Composition of Basilicum Oil.

The chemists of Schimmel and Co. have examined basilicum oil from the island of Réunion. As principal constituent methylchavicol, the methyl ether of p-allylphenol, $CH_3O.C_6H_4.CH_2CH=CH_2$ (1:4), was isolated. This was identified 1. by oxidizing it to homo anisic acid, $CH_3.O.C_6H_4.CH_2COOH$ (1:4), and by anisic acid $CH_3.O.C_6H_4COOH$ (1:4); 2. by converting it into anethol, p-propenyl phenolmethyl ether, $CH_3.O.C_6H_4.CH=CH-CH_3$ (1:4), when heated with sodium alcoholate. The oil was found to contain 60 p. c. methyl chavicol, the determination of the methoxy group being made, according to Zeisel's method.

Of other constituents the following were identified:—

1. Pinene, $C_{10}H_{16}$, by means of the nitrolbenzylamine base, melting at 123°;

2. Camphor, $C_{10}H_{16}O$, identified by means of its oxime; and

3. Cineol, identified by means of Wallach's hydrobromic acid reaction as well as by means of the iodol reaction.

A basilicum oil obtained from the Miltitz experimental farm contained only 25 p. c. methyl chavicol. Dupont and Gueslain (Compt. rend. 124, p. 300) have also recently examined French basilicum oil and found lævogyrate linalool besides methyl chavicol (estragol).

[Ber. Schimmel & Co., April 1897, p. 8.]

Pullegone from Citronellal.

In a former report F. Tiemann and R. Schmidt have suggested structural formulas for citronellol, citronellal and citronellic acid. They also demonstrated that upon dehydration citronellol could be converted into a cyclic alcohol, isopulegol, which alcohol upon oxidation yielded the ketone isopulegone. These compounds in many respects closely resemble pulegol and pulegone, but still are pronounced different from their respective isomers. In a more recent contribution they now show that by shaking isopulegone with aqueous barynm hydroxide solution for 50—60 hrs. or by letting it stand with an alcoholic solution of the same alkali for the same length of time, it is converted quantitatively into pulegone. Of the several possible explanations some credence at least seems to be given to the assumption that the iso compounds have a cycle of five members whereas pulegone is known to be a derivative of hexa methylene.

[Berichte, 30, p. 22.]

Oxydation of d- and l-Citronellol.

Having established the formula $(CH_3)_2\ C:CH.CH_2.CH_2.CH(CH_3).CH_2COOH$ for citronellic acid, F. Tiemann and R. Schmidt have made a special study of the oxydation of the lævo as well as the dextro forms of citronellol. The oxydation of the dextro form, as the cheaper, was studied first. The experience gained was then applied to the study of l-citronellol (rhodinol) from rose oil and from Réunion-geranium oil (réuniol). In addition to citronellal and citronellic acid, isopulegone was isolated in the form of its carbazone. The authors are of the opinion that the supposed menthone of Barbier and Bouveault (C. r. 122, 727) is identical with isopulegone.

[Berichte, 30, p. 33.]

Alcoholic Fermentation without Yeast-cells.

E. Buchner states that the separation of fermentation from the living yeast cell had not been accomplished heretofore, but he recently reported a method by which this could be accomplished. Beer-yeast was deprived of all possible external moisture and triturated with quartz sand and infusorial earth. The resulting magma yielded under great pressure a filtrate, which, even when filtered through a sterilized Berkefeldt infusorial earth filter, caused fermentation in concentrated solutions of cane sugar, glucose, fuctose and malt sugar. No fermentation was caused in concentrated solutions of milk sugar and mannitol. Neither are solutions of these two substances fermented by the living yeast cell.

As to the nature of the substance in solution that causes the fermentation, further experiments are to be made.

[Berichte, 30, p. 117.]

Compounds from Lichens.

O. Hesse continues his report (See Ber. 28, Ref. p. 288) on substances obtained from lichens. Usnenic acid was obtained from *Usnea barbata*, *U. longissima*, *Parmelia caperata*, *Cetraria pinastri*, *Cladonia rangiferina* and *Placodium saxicolum* and in all cases was found to have the composition $C_{18}H_{16}O_7$. The same acid had been found in *Cl. rangiferina* by Rochleder and Heldt, (Ann. 155, p. 51), whereas Hesse had found a β-usninic acid in the same lichen. Stenhouse (Ann. 117, p. 346), then called it cladoninic acid. A mixture of *Cl. rangiferina* and *Cl. rangiformis* yielded more of this acid but a closer examination revealed it to be a mixture of the ordinary usninic acid and atranorinic acid, a decomposition product of atranorin. The substance obtained by Paterno and Oglialoro from *Lecanora atra* also seems to be a like mixture. Atranorin and several other lichen acids chrysocetraric acid, cetrapinic acid, vulpinic acid, rhizocarpic acid, prosomic acid, etc., are also discussed in this paper.

[Berichte, 30, p. 357.]

Botany and Pharmacognosy.

On the Biological Relations of Leaf and Blood Coloring Matters.

A general review of the relations of leaf and blood pigments as revealed by recent researches is made by M. Nencki. The reader is referred to the article itself for details, it being hardly practicable to prepare a satisfactory abstract in brief compass.

[Ber. d. D. Chem. Gesellsch. 18, 1896. Translated by Dr. G. C. Diekman in The Journal of Pharmacology, 1897, p. 68.]

Monsonia ovata.

This plant belongs to the natural order *Geraniaceæ* and to the same section as the genus *Geranium.* It might, therefore, be expected to possess astringent properties like those of *Geranium maculatum* of the United States. It is interesting to note that a tincture of *Monsonia ovata* prepared with rectified spirit (2½ ozs. to the pint) has been used with very great success in the treatment of dysentery by J. Maberly M. R. C. S., who publishes a long record of cases that should go far to prove the medical efficacy of this little known drug. It is an annual plant growing in the Vaal River district and probably elsewhere in Africa. It must be collected in January or February. The seeds have been brought to England in the hope that the plant might be successfully cultivated.

[Pharm. Journ., 1897, p. 162; from Lancet, Feb. 6, p. 368.]

Cellulose Inclusions in Cell Walls.

The closer study of the structure of thickened cell walls has shown inclusions of calcium oxalate and more rarely of calcium carbonate crystals overlaid and enclosed by layers of secondary thickening materials. Dr. Carl Mueller finds in parenchyma cells adjoining the endodermis in the roots of *Spiraea filipendula* thickenings in the angles adjacent to the intercellular spaces caused by enclosed masses of cellulose. In cross section, these cellulose masses have a quadrate or rhombic outline and resemble calcium oxalate crystals. They are elongated and pointed at each end. Each cell of the region in question contains such structure. The microscopic reactions show these masses to be sharply defined, cellulose masses imbedded in the cellulose walls. How widely spread this phenomenon is to be found, cannot be said.

[Ber. d. deutsch. pharm. Gesellsch., 7, p. 11.]

Honey-dew.

There has been much discussion as to the origin of the droplets of sweet secretion which fall from trees in mid-summer, sometimes in such abundance as to cover the pavements, and especially the twigs and lower leaves. In 1884, Boudier concluded that it was wholly of animal origin. In 1891, Büsgen in his important memoir on honey-dew seemed to support this view, though he discussed only the sweet secretion produced by insects. But various botanists, agriculturists and entomologists had pointed out clearly a two-fold origin of honey-dew. M. Gaston Bonnier has reinvestigated the question both by observation and experiment. He comes to these conclusions.

Honey-dew, while more commonly the product of *Aphidæ* and *Coccinellidæ*, is also of plant origin, as may be demonstrated by direct observation of the sweet droplets, as they appear at the stomata. The animal honey-dew appears during the day, the plant during the night, with a maximum at day-break. The conditions which favor its production are cool nights and hot, dry days. Increased moisture in the air and cloudiness favor it, other things being equal. Severed branches plunged in water, with the leaves shaded and in a saturated atmosphere, will produce honey-dew at the stomata, even when those on the tree are not doing so. The plant honey-dew in chemical composition approaches more nearly the nectar of flowers than it does that of aphides.

[Bot. Gaz. 23, p. 140; from Am. Bot. 10, p. 489.]

Development of Citrus Fruits.

M. Biermann has studied in detail the developmental history of the fruit of *Citrus vulgaris* and of related species and developes a number of interesting points.

The oil reservoirs of this family, the *Rutaceæ*, are usually referred to the lysigenetic order of formation, i. e., arising by the absorption of a group of cells as distinguished from the schizogenetic method, arising as an intercellular space by the separation of cells. Dr. Biermann finds that in reality the reservoirs in question arise primarily in a schizogenetic manner and are subsequently enlarged lysigenously.

Calcium oxalate crystals are present in different parts of the fruit wall. The crystal arises in the plasma of the cell and on reaching the proper size surrounds itself with a membrane consisting of unmodified cellulose. Thus enveloped, the crystal crowds away the protoplasm at one side of the cell and frequently attaches itself to the wall.

The glucoside, hesperidin, characteristic of the younger stages, is dissolved in the cell sap in quantities varying with the age. When the fruits have a diameter of from 5 to 15 mm. this constituent reaches its maximum amount, about 10 percent. It is most abundant in the parenchyma of the wall of the fruit and in the central, columnar mass of tissue. As maturity approaches, the amount of hesperidin diminishes. Tannin behaves in the reverse manner, being more abundant in the ripe fruit than in the younger stages.

The fleshy pulp of the fruit is made up of long, clavate structures containing the characteristic juices. These structures (*Zotten*) arise as conical projections from the epidermal and subepidermal tissues of the chambers of the ovary and already exist in a rudimentary condition at the time of blooming. Each of these clavate projections consists of an outer tissue of tangentially elongated, thickened elements enclosing polygonal cells with extremely thin walls. When the *Zotten* nearly fill the chambers of the growing fruit, the transitory starch present in the cells is changed to some sugar capable of reducing Fehling's solution, probably dextrose. At the same time the *Zotten* become turgid with juices.

Other points of interest are revealed which the reader must seek in the original.

[Arch. d. Pharm., 235, p. 19. Complete work as Inaugural Dissertation, Bruns, Minden, 1896.]

Asa foetida.

In his twenty-fourth report on the Examination of secretions Prof. Tschirch summarizes the work by J. Polásek on this oleoresin. Although the volatile oil is included in the assay, a special study was made of the resin. The assay of the pure tears of *asa foetida amygdoloides* yielded the following results:—

Resin soluble in ether (ferulic acid ester of asaresinotannol)	61.40 p. c.
Resin insoluble in ether (free asaresinotannol)	0.60 "
Gum	25.10 "
Volatile oil	6.70 "
Vanillin	0.06 "
Free ferulic acid	1.28 "
Moisture	2.38 "
Residue (impurities)	2.50 "
	100.00 p. c.

Asaresinotannol has the formula $C_{24}H_{34}O_5$. A benzoyl and an acetyl derivative were prepared, consequently the presence of one hydroxy group is assumed. Upon hydrolysis with sulphuric acid, umbelliferone is obtained as a secondary product. When ferulic acid is heated with resorcin and 55 p. c. sulphuric acid in sealed tubes, umbelliferone is obtained synthetically together with guaiacol. Upon nitrification the resin alcohol yielded picric acid. [Arch. f. Pharm. 235, p. 125.]

Blood and Chlorophyll.

A. Tschirch has studied the optical properties of the pure coloring matters of chlorophyll and blood by a very interesting method and has obtained striking results. The spectra of the chemically pure coloring matters were photographed with the quartz spectrograph.

The essential results obtained were as follows: The yellow constituent of the pigments of leaves, the xanthophyll of many authors, is a mixture of xanthocarotin, which in solution shows three absorption bands in the violet and xanthophyll, in its narrower meaning, which in solution shows no bands and absorbs only ultraviolet. Both are free from nitrogen and are crystallizable.

The green pigment, chlorophyll, is probably a paired compound of phyllocyanic acid and an unknown colorless substance. Phyllocyanic acid contains nitrogen and probably in the pyrrol ring. The examination of the spectra of these constituents and of their compounds in comparison with the coloring matters of the blood leads the author to the conclusion that we are justified in assuming that in the substances of the chlorophyll group of coloring matters and in those giving color to the blood, one and the same grouping of atoms is present. Since the absorption in the violet is constant for both classes within narrow limits, this grouping of atoms possesses a considerable stability and therefore contains the same nucleus. He further assumes that this nucleus present in both is the pyrrol ring. This near relation between the two biologically most important coloring matters, in view of the rôles they play, is exceedingly suggestive.

[Photogr. Mittheilungen, 1896, Heft 24.]

Comparative Structure of Fern Rhizomes.

Dr. Walter Laurén has studied the anatomy of the rhizomes of *Aspidium Filix mas* and other ferns liable to be confused with it. He regards the number of vascular strands of the leaf stalks, a characteristic on which classifications have frequently been based, to be of doubtful value for this purpose. Microscopic study showed the presence of the internal glandular structures which secrete the medicinally active principles in *Aspidium Filix mas, A. rigidum, A. spinulosum, A. dilatatum* and *A. crystatum*. These glands are lacking in *Athyrium Filix fœmina, Aspidium montanum* and *A. lobatum*. In the latter group, intercellular spaces in the fundamental tissue are also lacking.

The secretion appears between the cuticle and the wall of the cell proper, as in the epidermal glands of the Labiates and Composites.

The author describes in detail the form and structure of the chaffy scales found in the above named species. Dr. Laurén has prepared a key for the ready separation of these species which uses these scale characteristics.

I. Chaffy scales without glands (or, if present, only two at the base of the scale).
  A. Margin of scales entire, *Athyrium Filix fœmina.*
  B. Margin of scales with long, simple, pointed teeth, *Aspidium Filix mas.*
  C. Margin of scales exceedingly irregular throughout from large number of teeth present, *Aspidium lobatum.*
II. Chaffy scales with glands.
  A. Margins with pointed teeth, *Aspidium rigidum.*
  B. Margins entire,
    a) Glandular trichomes uniform, unicellular, at margin only, *Aspidium crystatum, A. spinulosum, A. dilatatum.*
    b) Glandular trichomes of two types: short, unicellular, and large, long pedicelled; both at margins and faces of scales, *Aspidium montanum.*

[Schweiz. Wochenschr. f. Chem. u. Pharm. 1896, No. 48.]

Calcium Oxalate as a Reserve Product.

In order to test the truth of the usual statement of the text-books that calcium oxalate crystals represent an excretion product of the plant metabolism and are, therefore, of no further use in the plant, Dr. G. Kraus made a series of quantitive chemical analyses of plants under various conditions. He obtained the salt in the purest possible condition and titrated with chamaeleon.

To test the conduct of the calcium oxalate of roots during the production of shoots, analyses of *Rumex obtusifolius* were made early in the spring, Apr. 28, when the leaves formed a rosette on the ground, and again on May 21, when the tall flower stems were developed. No striking difference in the amount of oxalate found was to be noticed.

In order to ascertain in how far the calcium supply of the soil influences the conduct of the calcium oxalate in the plants, roots of the same species were transplanted into two kinds of soil, one of sand carefully freed from all traces of calcium, the other of sand liberally mixed with particles of a calcium salt. Both were placed in the dark to develop, thus securing the maximum destructive metabolism and, therefore, the maximum demand for reserves. After two months analyses were made, the oxalate content of the roots in the Ca-containing soil having suffered no loss, the roots grown in the sand on the other hand showed a large loss.

The author concludes that here the oxalate was drawn upon to supply calcium necessary to the development of the aerial parts. He also concludes than in normal vegetative processes, according to the needs of the plant, this compound is dissolved and used.

The study of the action of calcium oxalate in barks was preceded by a number of preliminary analyses which shed light upon this constituent. The analyses of whole barks gave the following results calculated in percent of dry weight.

Apple stems, 1½ cm. thick, October	3.88 %
Ash " 2 " " November	1.06 "
Horsechestnut branches, 10–12 cm. thick, Nov.	4.44 "
" trunk, 45 cm. thick, August	10.02 "
Elm " 35 " " "	14.64 "
Guaiac bark, purchased, Gehe & Co.	18.90 "
Quillaia " " " "	21.40 "
Pomegranate bark, commercial	36.64 "

The distribution of the oxalate in thick trunk-barks was as follows:

Horsechestnut bark, September.
Outer bark, 10.10%; inner bark, 12.60%.

Oak bark, stem 30 cm. thick, autumn.
Outer cortex, 4.96%; middle cortex, 7.23%; inner cortex, 8.09%; bast, 11.03%.

Linden bark, 95 year old stem, winter.
Outer cortex, 5.60%; inner cortex, 11.92%; bast, 12.24%.

Pomegranate bark, various ages, autumn.
Twigs, ½ cm. thick, 5.54%; twigs, 1½ cm. thick, 12.03%; twigs, 2—3 cm. thick, 18.34%; trunk, 8.5 cm. thick, 42.12%.

As a result of analyses made at different periods of the growing season, Dr. Kraus came to the conclusion that during the time of the development of the buds, the calcium oxalate content of the bark undergoes a marked decrease. The amount of loss resulting from the spring development ranged between 12 and 42 percent. This fact is accepted as evidence that the salt is made use of during time of great activity seen in the spring.

The solubility of calcium oxalate in various plant acids was tested and found to take place in appreciable quantity in concentrations varying from 1/10 to 1/1000 percent. Crystals after this treatment presented a corroded aspect.

The author regards the sap stream passing from the roots upward through the stem as the dissolving medium and sees in the large calcium content often observed in the sap of trees a confirmation of this view.

[Flora, 83, No. 1, p. 54.]

Camphor Production in China.

Since the cession of the island of Formosa to Japan and the consequent concentration of the camphor production in the hands of the Japanese, other possible sources for this drug are desirable to restrain Japanese monopolistic tendencies.

China seems now to offer the most promising field. Although the camphor tree, *Cinnamomum camphora*, has been long known to the Chinese, it has been until only a recent date regarded solely as the source of a valuable timber. In 1885, camphor was known on the Chinese mainland as an article of commerce in but a single province, Chekrang. A few exportations only were, however, made from this region. In 1895, however, the exportation of considerable quantities from the provinces of Fukien and Kwangsi was made through several seaports. The total export for that year from the Chinese mainland was 1756 piculs (1 picul = 60.48 kilograms). The Chinese camphor production promises at present to develop into considerable importance.

[Pharm. Journ., 1897, p. 201.]

New Remedies.

Hydrargyroseptol.

This new antiseptic is also prepared by the above manufacturers. It dissolves in water forming a slimy, odorless mass, not unlike yolk of egg in appearance. Chemically it is a combination of quinosol mercury with sodium chloride, its composition being $C_9H_5N.O.SO_3Hg.+_2NaCl$.

Methaethyl.

This new local anæsthetic reported upon on page 76 of this year's Review, consists according to an examination by Dr. G. Henning largely of ethyl chloride with small quantities of methyl chloride and chloroform. The boiling point of this liquid was found to be 10.5°; its congealing point, — 30°. Its specific gravity is 0.9173 at 4°. Treated with alkalies, methaethyl is slowly decomposed into alcohol, hydrochloric acid and formic acid.

[Pharm. Zeit., 1897, p. 200.]

Argentol.

Argentol, a new antiseptic, has recently been brought upon the market by Franz Fritsche & Co. It is a combination of silver with oxyquinoline and is intended to replace silver lactate and citrate, over which it is claimed to have the advantage of lesser stability, easily breaking up in the presence of septic matter into the strongly antiseptic oxyquinoline and metallic silver, which latter itself, according to Credé's experiments, has a great healing effect. Since the preparation is a non-irritating, non-poisonous, difficultly soluble powder, it is especially adapted to replace iodoform and other silver preparations, which upon decomposition separate out silver oxide.

According to the manufacturers, argentol has the composition $C_9H_5N.OH.SO_3Ag$. It can be applied as a dusting powder, made up into ointments with vaselin or lanolin, or used as an injection in gonorrhoea made up into an emulsion, 1:1000—3000.

[Pharm. Zeit., 1897, p. 174.]

Holocaine.

This is recommended by Dr. G. Gutman (D. Med. Wochenschrift, 1897, 11) as a substitute for cocaine in ocular surgery. Concerning its chemical nature Dr. Tauber (l. c.) writes: Holocaine is p.—diethoxyethenyldiphenylamidine. By combining molecular quantities of phenacetine and p.—phenetidine, holocaine is formed, water separating out:

$$OC_2H_5.C_6H_4NHCO.CH_3+H_2N.C_6H_4.O.C_2H_5=$$
$$OC_2H_5.C_6H_4NHC.CH_3.N.C_6H_4.O.C_2H_5+H_2O.$$

Holocaine is a strong base, insoluble in water, forming beautiful crystals which melt at 120°; its crystalline salts are also difficultly soluble in water. The hydrochloric acid salt forms white needles which are readily soluble in boiling water. The aqueous solution is slightly bitter, neutral in reaction and is not changed by boiling. If the boiling is conducted in vessels of poor glass instead of porcelain, a slight turbidity sometimes occurs due to the liberation of some insoluble free base by the alkali of the glass. The solution of holocaine hydrochlorate is quite permanent, a 1 % solution having been kept for months in an open vessel without signs of decomposition. The preparation is manufactured by the Farbwerken vorm. Meister Lucius & Brüning in Höchst a. M.

[Pharm. Zeit., 1897, p. 192.]

A Tasteless Quinine Compound.

Quinine chlorcarbonicester ($O.Cl.CO.C_{20}H_{23}N_2O_2.$], is said to have the advantage over quinine of being free from bitter taste, while dissolving with sufficient rapidity in the stomach to insure prompt absorption. According to the D. R. P. No. 90,848 of the Vereinigten Chininfabriken Zimmer & Co. in Frankfurt a. M., this preparation is manufactured by allowing phogene, either as a gas or dissolved in benzol toluol, etc. to act upon anhydrous quinine, either dry, or dissolved, or suspended in a proper medium. The crystalline mass so formed is washed with benzol and then digested with water to remove the quinine hydrochlorate which is also formed. Quinine chlorcarbonicester crystallizes from alcohol in fine colorless needles, m. p. 187—188°; it is less basic than quinine and gives in solutions the thalleioquine reaction.

[Pharm. Zeit., 1897, p. 192.]

Peronin, a New Narcotic.

Peronin, which was recently brought upon the market by Merck and gives promise of extensive use, is the hydrochloric acid salt of morphine benzylester, produced by replacing the hydrogen of the hydroxyl group in morphine, which is analogous to the phenol-hydroxyl group, with the alcohol radical ($C_6H_5CH_2$).

It has proved itself a good narcotic, somewhat weaker than morphine, but showing the disagreeable properties of this alkaloid in a much smaller degree. Schröder (Ther. Monatsh., Jan. '97), who has tried the effect of peronin on several persons, ranks it with regard to its therapeutic properties, intermediate between morphine and codeine. It is claimed to be preferable to the latter in that it produces a sounder sleep and causes no excitement.

Peronin ($C_{17}H_{18}NO_2.O.C_6H_5CH_2HCl$) forms a voluminous, white powder, consisting of very fine long prismatic crystals. Upon heating above 200°, or upon rapid heating even below this temperature, it is decomposed, giving off fumes of a pleasant, benzoin-like odor. At 15° it dissolves in water in the proportion of 7.5:1000, but dissolves readily in 10 p. of boiling water, the aqueous solutions having a bitter taste and being neutral to litmus. It is further soluble in 218 p. of 95 p. c. alcohol, in 100 p. methyl alcohol, and in 390 p. chloroform. In acetone, ether and amyl alcohol as well as in dilute mineral acids it is practically insoluble.

Although precipitated from its solutions by the general alkaloidal reagents, peronin differs not only in its solubilities, but also in its behavior toward special reagents, from morphine and codeine. Thus it yields, when heated with concentrated sulphuric acid, brownish-red, red, and finally dark red solutions, while codeine and morphine remain colorless under like conditions. Again, peronin does not produce a blue coloration with a solution of ferric chloride and potassium ferricyanide, nor does it liberate iodine from solutions of potassium iodate in very dilute acetic acid, even upon warming (difference from morphine). In concentrated sulphuric acid containing a little ferric chloride, peronin dissolves to a brownish-red solution (difference from codeine, which dissolves in this reagent with a blue or violet color). [Dr. Aug. Schneegans in Jour. der Pharm., Vol. 24, p. 59.]

An Alum Water from Lee Co., Va.

This water is from a spring on the farm of Dr. J. E. Browning, 9 miles northwest of Jonesville, Lee Co., Va., and was analyzed by L. E. Smoot. It is odorless, colorless, with a decided acid reaction and strong alum taste. Temperature at spring, 70° F. Upon analysis it is found to contain in 1 liter:

	Gram.
Aluminia	0.891
Ferric oxide	0.120
Soda (and trace potash)	0.060
Sulphuric oxide	2.530
Nitric acid	0.006
Silica	0.108
	3.715

From which we calculate. One pint contains

	Grams.
Aluminium sulphate	21.805
Ferric sulphate	2.190
Sodium sulphate	1.015
Sulphuric acid, free	1.598
Nitric acid	0.050
Silica	0.788
	27.446

This peculiarly large amount of aluminium sulphate seems worthy of note. This water is about twice the strength of the strongest alum water of Stribling Springs, Augusta Co., Va., which in other respects it much resembles. [Am. Chem. Journ. 19, p. 234.]

Soda Tablets with Loretin.

The iodoform substitute, loretin, cannot only be used on the living organism but can also be employed as a disinfectant for surgical instruments. Whereas iodoform cannot be used for this purpose, loretin can be brought into aqueous solution by means of sodium carbonate. If loretin is mixed with sodium carbonate and compressed into the form of tablets, a convenient form results in which this disinfectant can be applied to surgical instruments as well as to the disinfection of the hands, etc. The chemical factory in Helfenberg, near Dresden, has introduced such tablets which dissolve in a liter of hot water forming a light yellow solution which acts as a germicide.

[Pharm. Centrh. 38, p. 234.]

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21. Ueber das Dammarharz. Von G. Glimman. Pamphlet, pp. 5.
22. Ueber die Früchte von Myroxylon Pareiræ und den weissen Perubalsam. Von H. Germann. Pamphlet, pp. 7.
23. Ueber das gelbe und rote Xanthorrhœa-(Acaroid-) Harz. Von K. Hildebrand. Pamphlet, pp. 10.
24. Ueber die Asa foetida. Von J. Polásek. Pamphlet, pp. 8.

Indische Fragmente.

3. Beiträge zur Kenntniss der Entwickelungsgeschichte der Früchte von Citrus vulgaris Risso und anderer Citrusarten. Von Max Bierbaum. Pamphlet, pp. 9.

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[*] Not for sale. Copies, however, can be had from the chairman, Dr. Chas. Rice, by sending 7 cents in postage for carriage.

Reviews.

In Nacht und Eis. Die norwegische Polarexpedition 1893–1896. Von Fridtjof Nansen. Mit einem Beitrag von Capitain Sverdrup. 2 vols, pp. 1034, with 207 illustrations, 8 chromos and 4 maps. Publ. by F. A. Brockhaus in Leipzig. 1897. $6.20.

The dreadful glacial wilderness of the polar regions of the globe seems to have exercised a strange fascination on sea-faring men at all times, and especially the present century has witnessed a number of expeditions for the exploration of the unknown polar seas. In consequence, these have become better known little by little, while the geographical north-pole has been approached within nearly 50 sea-miles by the Norwegian explorer Dr. Fridtjof Nansen in 1895.

After the unfortunate expedition of Sir John Franklin in 1845, wherein the two ships "Erebus" and "Terror" and all on board perished, had disappeared, governments and private persons for the next ten years sent out a number of expeditions in search of Franklin until Mac Clintock in 1857 ascertained the fact that the Franklin expedition had perished and that Sir Franklin had died in June 1847. Among more recent north-pole expeditions there have also been two American ones, one under Lieut. Greely from 1881 to 1884 and another under Capt. Peary in 1892. All these expeditions, although unsuccessfull in so far as they prematurely became stuck in the polar ice, contributed more or less to enlarge our knowledge about the physical geography and the deep-water currents of the polar seas.

Fridtjof Nansen, born in 1861 in the neighborhood of Christiania in Norway, had accomplished several expeditions into the polar region, in 1888; he had crossed the immense fields of drifting ice, reaching as far as Greenland and crossing this large island. This unusually daring accomplishment and his evident knowledge of and familiarity with the scientific and practical conditions requisite for arctic researches and explorations, as well as his theories about the arctic deep-water currents, laid before the Royal geographical society of London in 1891, induced the Norwegian government and a number of admirers of the daring explorer to enable him to fit out an exploring expedition, so as to give him a chance to demonstrate the correctness of his theory that it would be possible to approach the north-pole by entrusting his ship to the polar current drifting in the immense icy world of the polar region from the New Siberian islands towards the north-pole and beyond to the northern Atlantic seas along the shores of Greenland. Nansen had a ship, the "Fram", constructed and built according to his design, so that it would withstand the tremendous ice-pressure exerted during the enormous low temperatures during the winter months. He started with twelve selected companions on June 20, 1893, from the northernmost port of Norway. For three years no news was heard of the expedition and the opinion more and more prevailed that the "Fram" might have met with the same fate as the ship "Javette" of the Bennett (New York) expedition, which in 1879 had been crushed by ice-pressure. The more gratifying, therefore, was the news received in August 1896 of the safe return of Nansen and one week later of the ship "Fram" also.

Nansen and Lieutenant Johansen had left the "Fram" in March 1895 on snowshoes with two boats on sledges with a number of polar dogs with a view to crossing the tremendous icy wilderness toward the pole. They succeeded in passing northward up to the latitude of 86° 13′ 36″, or nearly 50 geographical miles toward the north-pole, the lowest temperature they experienced being −41.7°. They then turned southward reaching Franz Josephland in June 1896, where they met near Cape Flora the English explorer Captain Jackson and his steamer "Windward". On August 7th the "Windward" started toward Norway with the two explorers, landing on August 13th at the port of Vardœ in northern Norway. One week later the news of the safe return of the "Fram" at the Norwegian port of Skarvœ was received. The Nansen-expedition had thus, after an absence of more than three years, safely returned without the loss of a single man and with most important results, particularly in regard to the prevailing deep-water currents of the northern polar regions, as well as to the discovery that the polar seas surrounding the geographical north-pole of the globe are not, as hitherto supposed, a shallow water with many islands, but a very deep basin reaching over the entire polar region. The immense ice masses covering these seas seem to be in constant motion from the Beringsstrait and from the coasts of Siberia across the great polar basin towards the north Atlantic ocean along the coasts of Greenland.

Dr. Nansen has described his and his companion's expedition, lasting for more than three years, in this work just published under the title "In Night and Ice". A master among modern explorers, he has also proved by this book his mastership both as a scientist and as a fascinating writer. His book meets the keenest anticipations in every respect and will be a delightful and instructive reading in all countries. It needs no further introduction, finding unprecedented interest and demand. The excellent maps, chromos and reproductions of the original photos of Dr. Nansen greatly enhance the instructiveness and the value of the work.

Upon the invitation extended to Dr. Nansen from learned societies from all countries, he has just returned from triumphant visits to Berlin, London and Paris; his next visit will be to the United States this fall, where he undoubtedly will meet with an appreciative and warm reception.

Fr. Hoffmann.

The Year-Book of Treatment for 1897. A Critical Review for Practitioners of Medicine and Surgery. Lea Brothers & Co., Philadelphia and New York.

The busy practitioner of the present day finds in such annuals as this many helps which he might overlook; and it is often the case that if it were not for such books as this, which give in a concise manner the points gleaned from the literature of the year by men especially interested in each department of medicine, he would miss many of the advanced ideas.

This annual is, as one can see from the list of contributors, of British origin. But as one looks through the book it is immediately noticed that no contributor has confined himself exclusively to British literature for his facts; for we often find abstracts from German, French and American periodicals following each other on the same page.

The article on Orthopædic Surgery is followed by a short "Bibliography" which gives the titles and publishers of the principle books in that department of Surgery. This is an excellent feature, and should have been made use of by each contributor.

It is needless to discuss the merits of each department. Although "Brown-Séquards so-called 'Elixir of Life' followed its inventor to a common grave; and the disease of old age, to which all mankind is liable, is still considered incurable;" still it is pleasing to find mention of the good results obtained by the use of the extract of the thyroid gland, *thyroidin*, and of the pancreas, *pancreatin*; the former in goitre and the latter in diabetes.

Although no mention is made of it, it may be well to state that thyroidin has produced exceedingly good results in the treatment of myxœdema.

Altogether the book is one which can be read with profit by the class of physicians for whom it is designed and deserves the success which it has had in the past. *W. S. Miller.*

Das letzte Aufflackern der Alchemie in Deutschland vor 100 Jahren. (Die Hermetische Gesellschaft 1796—1819.) Ein Beitrag zur deutschen Kulturgeschichte von Ernst Schultze in Berlin. Verlag von Gg. Freund, Leipzig. Pamphlet, pp. 44. 1897. M. 1.80.

On Saturday, October 8, 1796 there appeared in the Reichsanzeiger, one of the most popular German papers, an article under the title Higher Chemistry, and signed The Hermetic Society. The author states that chemistry had assumed such form that it could appreciate the axioms and fundamental principles of alchemy, that many thousand heads and hands in Germany were busy with the study and solution of alchemistic problems, that there was alchemy and alchemy, and that a society of unselfish alchemistic students had been organized to promote true alchemy by cooperation.

This communication created a great sensation and letters were received from men of high standing in politics, society and the professions, also from the humblest persons, ignorant and almost illiterate. The manner in which this correspondence seems to have been utilized would have done credit to a modern sensation paper. A reaction, however, set in and discontent on part of many of the unsatisfied correspondents seems to have caused the Reichsanzeiger to withdraw. The society, nevertheless, continued to exist and made several attempts at publishing its own journal.

If the sharks and fools had been busy writing, the enemies of alchemy were not altogether quiet. The same journal contains a communication by Wiegleb in which he denounces and ridicules the Hermetic Society. One sentence may be quoted: "Statt aller dadurch Verunglückten mag Bernhard Perrot auftreten und sein letztes Urtheil davon sagen, das also lautet: Wer jemanden uebel will, aber sich nicht erkuehnen, ihn oeffentlich anzugreifen, der veranlasse nur, dass er auf Goldmacherey verfalle."

People at that time asked, and we may inquire: who constituted this Hermetic Society? Its members are readily enumerated:— Kortum, a physician and the author of the well known Jobsiade, and Baehrens, a theologian. Kortum was a close student of alchemistic writings and possessed a considerable library of alchemistic books and manuscripts. He was known as a writer on alchemistic subjects though not himself an experimenter. Baehrens, on the other hand, knew very little about alchemy, but experimented. Baehrens had written to Kortum for information and thus began a correspondence of extreme interest. This correspondence began in 1795. In the following year Baehrens suggested to Kortum to discuss the subject of their correspondence in the Reichsanzeiger. Kortum at first hesitated, but yielded later, stating that if no good came out of the publication the expected communications might at least afford some amusement. Baehrens, however, who was the schemer hoped that valuable information might thus be obtained. By making people believe that they had discovered the true *materia prima*, others, in the hope of receiving valuable information, might disclose such. Honorary membership was also held out as inducement. Whereas Kortum largely supplied the alchemistic essays and correspondence, Baehrens was the motive power, using Kortum and others as his tools.

As might be expected, the sensation gradually lost its charm for the multitude and the few faithful ones gradually became more and more discouraged, Baehrens being the only one who obtained any benefit in the way of honors and appointments.

The pamphlet is replete with interest from beginning to the end. It is truly a contribution to the history of civilization. On the last pages the author speculates somewhat as to the condition of human society that should have made such a chapter in our history of the past hundred years possible. He is of the opinion that to us it must appear ridiculous that a society could keep up such a farce for several years in one of the most prominent newspapers of Germany. The same motives that underlay most of the letters published and unpublished, the desire for wealth and longevity, make possible year in year out in this country the daily publication all over the country of the most absurd statements and barefaced lies that the world has ever witnessed. Hundreds or thousands of dollars if not millions are annually spent in advertising secret preparations, so-called patent medicines, and the duped public spends twice and three times as much in the blind chase after the life-giving elixir. The following stanza from the Jobsiade, written by Kortum while he was greatly interested in the Hermetic Society, clearly shows what opinion he held of this class of people.

> "Sein Praeservans contra alle Krankheiten
> Bestand aus Honig und einigen Kleinigkeiten;
> Und etwas Eichenrinde mit Fliedermus war
> Das Koenigliche Restauratio Electuar."

E. K.

Bericht über die Pharmacognotische Litteratur aller Länder. Herausgegeben von der deutschen pharmaceutischen Gesellschaft. Bericht für 1896. Theil II.

In the second part of the report issued by the commission placed in charge of this work, we find in a collected form, the essential results of a large number of investigations. The hope was expressed when the first part appeared that, if the publication of such a report was undertaken, it should be made as complete as possible. Completeness in even a moderate degree could hardly be predicated of Part I and, it must be said with regret, Part II shows no evident improvement in this respect. The Bericht thus far fails to be "eine Centralstelle für die fortlaufende Berichterstattung über sämtliche Arbeiten welche die botanische, chemische und pharmacologische Erforschung der Heil- und Giftpflanzen aller Länder betreffen",* and fails to reach the mark set for it not only by our hopes and expectations but also by the body fathering it.

Selected articles have been abstracted but importance of content does not seem to have been the characteristic required to give admittance. A comparison of the titles of contributions donated to this commission and acknowledged from time to time in the numbers of the Bericht proper with the titles of articles abstracted, fails to show any close connection here. On what basis selection was made is not apparent.

Owing probably to the fact that the work of preparing abstracts is in the hands of several workers without, as yet, a well defined common policy, some articles are printed well nigh entire and occupy space out of proportion to their significance, e. g., East Indian drugs described in Gehe & Co.'s Bericht, Sept., 1896.

All criticism aside, the work as it stands has a value not to be underrated and it will doubtless become as it is almost a necessity. When a work of this kind is being done, however, it is very much to be regretted that it fails to enter a still larger field of usefulness. *Rodney H. True.*

Die Fabrikation der künstlichen Mineralwässer und anderer moussirender Getränke von Dr. B. Hirsch in Dresden und Dr. P. Siedler, technischer Leiter der Dr. Struve und Soltmann'schen Mineralwasserfabrik in Berlin. Ein Bd., pp. XII, 393, mit 103 eingedruckten Abbildungen. Dritte, neu bearbeitete Auflage. Druck und Verlag von Friedrich Vieweg und Sohn, Braunschweig. 1897. M. 8.00.

The artificial preparation of mineral waters was attempted by the ancients in an empirical manner. It was first placed on a somewhat scientific basis after the attempts of Thurneisser to analyse natural waters. These analytical methods, however, did not assume a practical form until after the discovery of the fixed alkalies and of carbonic acid by van Helmont in the 17. century. This enabled Friedr. Hoffmann (about 1700) and Venel (1755) to proceed to a rational method of preparation. In these early attempts the carbonic acid was generated in the flask. In 1767 Beroley showed that the gas could be generated in one flask and passed into another. This method was improved by Priestley (1772), Lavoisier (1773) and others.

Since then the mineral water industry has developed rapidly and especially in the second half of this century. The first edition of this monograph was published in 1870, the second sixteen years later. The present edition, which was largely rewritten, is divided into the following chapters: Mineral waters in general; "half natural" mineral waters; artificial mineral waters; ingredients; apparatus; preparation; recalculation of analyses; artificial medical mineral waters which do not occur in nature; examination of artificial waters; effervescent beverages; laws, ordinances, legal decisions etc.

The definition or definitions of a "mineral water" quoted by the authors have a scientific air about them, yet they are less in accord with what might be termed the actual facts than the definition given in one of the special U. S. census bulletins for 1890, in which all marketable waters are classified as "mineral waters". Certainly no scientific or any other tribunal could give a satisfactory or logical classification of natural waters on any other basis. It certainly seems undeniable that the "discovery" of mineral springs increases with the advance of civilization of a country.

In spite of the fact that the horizon of the authors was evidently limited largely by the boundary of their country, the American mineral water manufacturer and even the pharmacist will find much in this book than can be made practically useful. Good working formulas of the most important springs of medicinal repute are alone of no small value. The supply merely of a water that is free from contamination and agreeable to the taste would prove a matter of greater credit to the druggist than the various favors which most druggists shower upon their customers in order to attract trade. The question of pure water supply is not only a perplexing one in large cities, but is vital everywhere. Especially is this true where river- and ice-water afford the only drinking water on account of the alkalinity etc. of the wells.

The book-work is of the usual excellence characteristic of the firm. The monograph, for more than one reason, should find a place in the library of every well regulated pharmacy. *E. K.*

Anleitung zur mikrochemischen Analyse der wichtigsten organischen Verbindungen. Von H. Behrens, Professor an der Polytechnischen Schule zu Delft. Viertes Heft. (Karbamide und Karbonsäuren). Brochure, pp. 129, mit 94 Figuren im Text. Verlag von Leopold Voss, Hamburg und Leipzig. 1897. M. 4.50.

Fascicle one of this interesting and valuable work including the anthracene group, the phenoles, quinones, ketones and aldehydes appeared late in 1895. Part two dealing with the more important fibres, and part three containing the aromatic amines appeared in 1896. These parts were duly reviewed in the columns of this journal last year. The fourth installment, including the carbamines and organic acids, now lies before us. After what has already been stated about the general character of the work, little need be said here, whereas the title page itself sufficiently indicates the contents.

Some chemists are of the opinion that microchemical methods cannot be recommended too urgently, because very small quantities of material as a rule suffice in the hands of the expert to obtain positive results, and because a microscope with appliances and a few test tubes are about the only tubes necessary for such work. The facts, however, are that the chemist as a rule has larger quantities at his disposal and consequently prefers to make macroscopic tests and reserves microscopic methods for supplementary tests and to instances in which his material is exceedingly limited.

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* Bericht d. deutsch. pharm. Gesellsch., 6, p. 5.

Attention has been called to another fact and this is probably more important, viz., that microscopic chemical analysis must be of great didactic value. It of necessity teaches the student to manipulate with exceeding care and would therefore tend to correct the slovenly habits often acquired in ordinary chemical analysis. This argument is a very good one and teachers of chemistry should heed it. Incidentally, in this connection, it may be of interest to call attention to the identification of caffeine and theobromine (p. 15). The crude alkaloid obtained by extraction is sublimed. The crude caffeine corresponding to 1 mgr. of tea e. g. is said to yield several sublimations each sufficient for microscopic examination. *E. K.*

Nouveau Formulaire magistral, par les Drs. A. Bouchardat, ancien professeur à la Faculté de Médicine de Paris, et G. Bouchardat, professeur à l'Ecole de Pharmacie de Paris, membre de l'Académie de Médicine, 31e edition. 1 volume in—18 de 690 pages, broché 3 fr. 50, cartonné à l'anglaise, 4 fr. Félix Alcan, éditeur.

The editions of this book succeed each other at short intervals as the new discoveries in medicine render revisions necessary. The volume, though concise, is very comprehensive, the 31st edition containing a description of Parisian hospitals, numerous tables of weights, measures, doses, etc., a brief outline of urinary analysis, a compendium of substances employed in medicine giving uses and modes of administration, a list of European mineral waters and their composition, an article on antidotes and treatment in cases of poisoning and asphyxia, an excellent chapter on hygiene, together with an enumeration of foods for diabetic patients.

The general remarks on pharmaceutical preparations are too brief to be of much value, but the lists of preparations given under each remedy are remarkably complete. Among the remedies added in this revision are trional, the preparations of menthol, of resorcine, of ichthyol, of piperazine and its homologues, the glycero-phosphates of lime, soda and iron, the thyroid gland preparations, so-called artificial serums for subcutaneous injections, formic aldehyde and its derivatives as antiseptics, etc., etc. Of remedies whose manufacture cannot readily be accomplished in a pharmaceutical laboratory, only the therapeutical applications are mentioned.

Although particularly intended for France, this formulary contains much information that would render it a valuable reference book to any pharmacist or physician in this country.

Richard Fischer.

Viola tricolor L. in morphologischer, anatomischer und biologischer Beziehung. Inaugural Dissertation zur Erlangung der Doctorwürde bei der hohen philosophischen Facultät der Universität Marburg, eingereicht von Henry Kraemer aus Chicago, Ill., U. S. A. Marburg, Universitäts-Druckerei von Joh. Aug. Koch. 1897.

Introductory to the closer study of the structure of the plant is a chapter treating in a very detailed manner the various allied forms of violets grouping themselves around this species. The significance of various external phenomena in causing the various local differences are discussed in the light of culture experiments. The morphology, developmental history and anatomy are treated very fully with very copious quotations.

Of especial interest, perhaps, is the presence of numerous slime cells in the lamina of the leaf. Certain epidermal elements seem, by the formation of a tangential wall, to have been divided into an epidermis cell proper, the superficial member, and an inner member, which becomes a slime cell. These slime cells are easily found in material preserved in strong alcohol and by proper treatment, they may be readily made out in herbarium specimens. They vary considerably in form. They are by no means confined to the varieties under immediate discussion, having been demonstrated by the author in thirteen other species as well.

Certain other slime bearing structures are present in the form of small, multicellular projections occuring at the tips of the stipular lobes, on the teeth of the leaf and at the tip of each calix lobe. They consist of a rounded, glandular head usually supported on a more or less elongated pedicel. Each gland has its origin in a simple epidermal cell and is formed at a very early stage of the development of the leaf. After completion of development, slime appears beneath the cuticle of the terminal cells. The increase in quantity progresses until the cuticle is ruptured and the slime escapes.

The function of the slime cells is the subject of considerable speculation. By some it is regarded as protective, by others it is looked upon as a water-retaining tissue.

The presence of slime-bearing elements in other genera of the family *Violacæ* was demonstrated. In some members of the genus *Rinorea*, they are questionably present. They were demonstrated in the genera *Anchietea*, *Schweiggeria* and *Hybanthus*. The representative of *Noisettia* examined contained none.

The anatomy and morphology of the various parts of the plant are described in considerable detail. For these and other features, the original paper must be consulted.

Rodney H. True.

Formulaire des médicaments nouveaux pour 1897, par H. Bocquillon-Limousin, pharmacien de 1re class, laureat de l'Ecole de pharmacie de Paris. Introduction par le Dr. Huchard, medecin des hôpitaux. 1 vol. in –18 de 308 pages, cartonné 3 fr. Librairie J. B. Baillière et Fils, Paris.

The seventh edition of this formulary was reviewed in the May number of last year's Review. In this new revision the author has brought the work up to date by adding a large number of articles recently introduced in medicine, not only synthetic preparations, but crude drugs as well. Although most of these remedies are more or less fully reported on in our various pharmaceutical journals, the convenient form in which they can be found in a book of this kind, amply repays the small expenditure entailed in securing a copy.

R. Fischer.

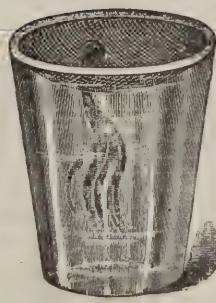
Bericht von Schimmel & Co. (Inhaber Gebr. Fritzsche) in Leipzig. Fabrik äther. Oele, Essenzen und chemischer Präparate. April 1897. Brochure, pp. 127.

The reports of this firm, formerly an annual but since a number of years a semi-annual, are anticipated with considerable interest by chemists, botanists and others who are interested in this class of plant products. Although even the older commercial reports were valuable the fact that to the commercial and technical aspects the more scientific aspect has been added has in late years made these reports all the more valuable and interesting. Besides reviewing the general progress each semi-annual seems to contain something of a more special nature. Thus the April report for this year contains a map of Japan indicating the provinces in which peppermint oil or camphor or both are produced.

In addition to the regular report this number also contains a table of volatile oils giving the botanic source, crude material, yield, physical constants and chemical composition. The table covers 53 pages and includes 277 oils. Those who have had occasion to make use of the table published by these reports in October 1893 will welcome the new revised edition. It is extremely serviceable. If references to the sources of information could be added the table would be even more valuable than it is at present. *E. K.*

Taschenbuch bestbewährter Vorschriften für die gangbarsten Handverkaufs-Artikel der Apotheken und Drogenhandlungen. Von Ph. Mr. Adolf Vomácka. Ein Bd., pp. IV, 122. Zweite, verbesserte Auflage. A. Hartleben's Verlag, Wien. 1897.

This formulary constitutes volume 181 of the Chemisch-technische Bibliothek of the publishers, a series of useful and practical monographs too widely known to require introduction. The formulas are not designed merely for the apothecaries and druggists of Austria, but are intentionally kept as general as possible. They are intended more particularly as a general working basis, from which the druggist can deviate in minor details so as to best meet the demands of his customers. In different countries these will naturally vary. Inasmuch as originality is claimed for most of the formulas, the live pharmacist will be glad to add this small formulary to his list of similar works. *E. K.*



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EDITORIAL.

In a recent number* attention was called to the difference between British and German universities as viewed from the standpoint of an Englishman. The view expressed is in harmony with the general awakening in England, to which attention has been repeatedly called within the past year, that it becomes necessary "to depart from old-fashioned habits" etc. in order to keep abreast with the progress of the times. The same number of the English journal quoted also called attention to the efforts being made to obtain an institute for teaching botany in London. The several botanical gardens in and about London afford excellent opportunities for investigation, especially in systematic botany, but little or no effort seems to have been made to take advantage of these facilities for teaching purposes.

Every person interested in the advancement of science will welcome each and every effort made by our British friends. As pharmacists we rejoice to see that our British confreres are taking an active interest in the present movement. Whatever our estimate of the relative position of English and American pharmacy may be, we can only be benefited by such a movement. We, therefore, do not envy the step that tends to place British pharmacy in a more favorable position, but welcome it knowing fully that it will stimulate Americans to even greater activity.

On this side of the water so-called practical men have supposed that the denunciations which prominent British students have visited upon their own universities for being cramming institutions applied to all institutions of higher and liberal education. What is needed and what is wanted by the British is the free atmosphere of the German universities where the students study e. g. the sciences for the love of science and truth, not merely because they may serve as a means for livelyhood in a certain profession. The very persons in this country who denounced and ridiculed the broad training afforded pharmaceutical students in laboratories of our own universities, took sides with those of our pharmaceutical institutions, in which the major portion of time was spent in attending lectures and cramming for examinations, for these examinations were almost the only criterion by which many a professor could judge his students. It is this kind of work that wide-awake British scholars have criticized for the past fifty years and more. Even the British business man is beginning to feel that there is something in a liberal education that qualifies ultimately even for business. Pharmaceutical education, which cannot for a moment be considered distinct from education in general, can be neither too broad nor too deep. It is well for us in America to have this fact emphasized in England, for those who cannot be convinced by logic will be forced to action by the desire not to be outdone by England. This view of the situation may not be very inspiring, yet it contains some element of encouragement.

The report of Dr. Springfeld, Medical-Assessor with the royal police commission (Polizeipräsidium) of Berlin, contains a number of data that should constitute a warning to some of those who desire to classify American pharmacists according to the plan in vogue in several European countries.

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* April number, Supplement, p. 13.

At the close of the year there were 946 places subject to revision: 25 factories of chemico-pharmaceutical preparations, 286 stores in which poisonous photographic supplies were sold and 635 drug-stores (not Apotheken, but pharmacies of the second class or Drogerien).

Of the drug stores 432 = 69 p. c. were inspected, 150 were controlled by secret purchase and 35 were searched thoroughly.

Of the proprietors of inspected drug stores 279 = 64 p. c. were fined, mostly for the contravention of one paragraph of the law.

The contraventions exposed by secret purchase throw even worse light upon the druggists (Drogisten, not Apotheker), because fines were levied in 71 p. c. of the cases.

The number of "Haussuchungen" was small, but in 97 p. c. of the cases positive results were obtained.

Of the Berlin druggists only 15 p. c. have escaped being fined. In the drug stores 738 persons were employed, of which number 36 p. c. was below 18 years of age.

Dr. Springfeld closes this part of his report with the words: "Für den Apotheker sind diese Ziffern beachtenswerth." They not only deserve the attention of the German apothecary and public, but they should serve as a wholesome warning to those American pharmacists who desire to improve their calling by creating several classes of pharmacists. Wherever this has been tried, it seems to have proved almost an absolute failure. In France they are at present trying to rid themselves partly of this evil by national legislation. In Germany, Austria and elsewhere the evil is such that it not only demoralizes legitimate pharmacy, but almost baffles the enforcement of the laws supposed to regulate those drug stores or pharmacies of the second class. Dr. Springfeld says: "The unconstraint with which the imperial orders are transgressed in Berlin is increasing from year to year. It no longer surprises one that the druggists declared in a meeting of protest that no druggist could any longer make a living without the customary contraventions." Yet to every pharmacy in Berlin there are five drug stores. Let us hope that American pharmacy will not repeat the experiment that has proved a curse to Europe.

"Amerika, das grosse Land, das sollt ihr einmal sehen. Da bleibt 'nem manchen der Verstand vor lauter 'Humbug' stehen." Europeans, and the Germans in particular, are very fond of singing this "Gassenhauer" in all possible versions, and on all possible occasions. Some time ago a German weekly recorded a bit of Scotch news. A country physician is said to make use of several carrier pigeons in cases of emergency. If medicine is needed immediately, he sends home one of his carriers with the prescription and other necessary directions. As soon as the carrier arrives, the servant examines the bird and carries out the written instructions of his master. The physician is also said to be in the habit of leaving one or several carriers with very sick patients, so that the nurse can send a carrier in case of a turn to the worse.

If true, this is a bit of practical genius; if invented, is not a bad story and worthy of a Scotchman. Why the editor of the German paper referred to should consider the story more plausible if it had emanated from America is comprehensible only to those Americans who, while abroad, have read German dailies and have been amused as well as disgusted with the stuff about America, with which the Germans are periodically fed.

Yet the same editor a few weeks later called attention to the fact that the shepherd Heinrich Ast, who has become famous as a disciple of a new branch of the healing art, pays a greater income tax than any other citizen of his district. This certainly does not augur well for the intelligence of the Germans who have the ills to which their flesh is due, diagnosed by an ignorant shepherd, not necessarily by appearing before him in person, but by sending a lock of their precious hair. That some Germans are still willing to be duped even after they have come to this country, became apparent since a brother of "Schäfer Ast" opened a branch office in Milwaukee, from which he sent the necessary locks with the equally necessary fee. The large Milwaukee dailies scarcely took cognizance of this new local industry, but the German pharmaceutical papers, who allott but very little of their precious space to America, heralded the news far and wide throughout the great fatherland. This, however, is perfectly in harmony with the style of German news.

About a year ago an object of historical interest was described in the columns of this journal. A month later it made the rounds in the German pharmaceutical journals as a new remedy. Still better, a New York pharmaceutical journal, published in the German language, copied the nonsense from its European contemporaries. Yet this journal, at about the same time, was heralded in Germany as the only remaining representative of German pharmacy in this country. No one in this country will envy the journal for its reputation.

Is one to conclude that in order to be a true representative of German scientific ideas in America implies the copying of German nonsense about this country? Let us hope not. The Pharmaceutical Review, whether published in the German or English language, has always boldly advocated German ideas wherever they seemed preferable to others. Whether this is done in the German, English or even Russian language should be wholly immaterial.

The time, however, is ripe for Europeans to refuse to be fed with nonsense about America and to get over the notion that all nonsense is necessarily of American origin. Knownothingism in America has lost its ground, because Americans have traveled extensively abroad, and because American newspapers and journals give, on the whole, substantial information about the European countries. European knownothingism about America, however, still seems to be the fashion. The German school teacher may teach his pupils that New York is the capital of the United States, if he considers this country of sufficient importance to constitute a fragment of a chapter in his course of geography or history, but it would be too much to expect him to inform himself about a country that is populated by the criminal and pauper offal of Europe. A Leipzig university professor, while examining an American student, questioned him with regard to a certain animal and remarked: "You certainly know all about this, it is found in your neighborhood, in Mexico, right near Boston." Unless those Europeans, who consider themselves educated and well informed, desire to continue to make themselves ridiculous in the eyes of intelligent Americans, who from residence and travel in Europe are sometimes better informed with regard to European countries than many Europeans, they must demand sound and healthy information from their papers and journals and cease to consider humbug as synonymous with American.

A recent number of a pharmaceutical weekly, printed in the German language, contains the following news item: "Wenn die alten Alchemisten aus dem Jenseits auf unser Jammerthal herabblicken würden, so müssten sie helle Freude empfinden. Denn ihr vielbelachtes, vielbespötteltes Streben und Suchen ist zu neuem Leben erwacht. Die Kunst des Goldmachens, die Transmutation, die Umwandlung der Metalle setzt frische Blüthen an. Man beginnt wieder vom Stein der Weisen zu sprechen, und zwar sind es die praktischen, nüchtern denkenden Amerikaner, welche die Umwandlung der Metalle nicht mehr als blosse Chimäre betrachten. Einige der dortigen Gelehrten, deren Namen in der wissenschaftlichen Welt einen guten Klang haben, behaupten sogar, dass es ihnen bereits gelungen sei, in kleinen Mengen—wenn nicht schon ein beliebiges Metall—so doch Silber in Gold zu verwandeln." The names of several prominent American scientists are then mentioned and we are informed that an Argentaurum Syndicate has been organized. The article concludes with the would-be joke: "Nun, wenn schon kein wirkliches Gold producirt werden kann, so dürfte dieses Argentaurum immerhin geeignet sein, den Actionären die Beruhigung zu gewähren, dass ihr Geld nicht verloren ist."

It ought to be needless to state, as one of the scientists referred to writes, "that there are no facts to justify the article." It is either the grossest ignorance about America and Americans, or it is downright viciousness that inspires such articles. Americans are so accustomed to this that, as a rule, they are inclined to overlook such matters. There are, however, times where silence is no longer a virtue. This is especially true if it becomes known that it is not only ignorance, but apparently dishonesty that underlies a given case.

A year ago a paper was presented to the Am. Med. Assn. at its meeting at Atlanta on the toxic action of certain chemicals, in which it was shown that their toxic action could be explained on the basis of the theory of electrolytic dissociation. Empirical knowledge with regard to these substances was thus placed on a scientific basis, which enabled the prediction of the properties of other similar substances. Several months later a detailed report was made in the Botanical Gazette. Reprints of these articles were sent to a prominent German journal. Yet this very journal a few months thereafter published an article by two German scientists, who had arrived at the same conclusions, without, however, taking the least cognizance of the earlier American investigators. American scientists are accustomed to see their investigations ignored by European, and especially by German scientists, but apparently willful ignorance of this kind should be stigmatized as dishonorable. The same journal has more recently published an abstract of the article sent to it almost a year ago. German supremacy in the scientific world will not last long if it has to be maintained by ignorance and dishonesty.

Those Americans, who have studied at German universities and are fond of cherishing a kindly feeling for the German fatherland of science, keenly regret such distortions based on ignorance and at times apparently on dishonesty. Many of them have succeeded in introducing German ideas into American universities and into American life in general. The successful carrying out of these ideas has redounded to the credit of Germany and German methods. Science, however, is not limited to German soil, and the educated German must learn to look beyond the boundaries of his country.

ORIGINAL CONTRIBUTIONS.

Note on Extemporaneous Chlorine Water.

By Dr. *F. B. Power.*

In the March number of the Review, p. 54, an abstract from the Pharm. Wochenschrift, 14, p. 87, and Bolletino farmaceutico, 1896, was given relating to the extemporaneous preparation of chlorine water. As the abstract in question is very brief, it may, for the purpose of comment, be quoted in its entirety.

"Chlorine water can be extemporized by the action of sulphuric acid on sodium chloride in the presence of minium or litharge with the requisite amount of water. The reaction is expressed by the following equation:

$$3H_2SO_4+2NaCl+Pb_2O_3=2PbSO_4+Na_2SO_4+3H_2O+Cl_2.$$

Inasmuch as such a preparation contains sodium sulphate, Griggi suggests the use of oxalic acid in place of sulphuric acid, and of calcium chloride for sodium chloride. The resulting calcium and lead oxalates are insoluble:

$$2H_2C_2O_4+PbO_2+CaCl_2=CaC_2O_4+PbC_2O_4+2H_2O+2Cl.\text{"}$$

Although these methods and the expression of the reactions intended to illustrate them may seem very plausible, as is indeed evident by their having already been noticed in at least three pharmaceutical journals, they nevertheless embody some peculiar errors to which it may be useful to direct attention.

In the first place the statement that "chlorine water can be extemporized by the action of sulphuric acid on sodium chloride in the presence of minium or litharge" is only partly correct, for although chlorine would be developed by the use of minium or red lead, Pb_3O_4, it could naturally not be developed by the use of litharge, PbO. Moreover, in the above illustration of the reaction neither of these two oxides is employed, but lead sesquioxide, Pb_2O_3, and if this be regarded as a compound of the monoxide PbO, and the dioxide PbO_2, it is the latter and not the former to which the development of chlorine is due.

With the use of minium or red lead, Pb_3O_4, the reaction would take place in the following manner:

$$4H_2SO_4+2NaCl+Pb_3O_4=3PbSO_4+Na_2SO_4+4H_2O+Cl_2,$$

or with lead peroxide, PbO_2, as follows:

$$2H_2SO_4+2NaCl+PbO_2=PbSO_4+Na_2SO_4+2H_2O+Cl_2.$$

In the latter instance the reaction is evidently quite analogous to that which ensues in the ordinary method of generating chlorine with the use of manganese dioxide, sodium chloride and sulphuric acid, or, indirectly, with the use of manganese dioxide and hydrochloric acid, but while in the latter case heat is required, with lead peroxide the reaction proceeds in the cold.

It is, however, the second reaction in the abstract above quoted which is of particular interest. This refers to the suggestion of Griggi to prepare an extemporaneous chlorine water by the action of oxalic acid on a mixture of lead peroxide and calcium chloride, as indicated by the previously cited equation:

$$2H_2C_2O_4+PbO_2+CaCl_2=CaC_2O_4+PbC_2O_4+2H_2O+Cl_2.$$

It was evidently assumed by Griggi that in this reaction oxalic acid performs the same function as sulphuric acid, but this is by no means the case. If, for example, calcium or barium chloride, lead peroxide and oxalic acid be thoroughly mixed in the above noted molecular proportions by trituration in a mortar, and then the requisite amount of water added, a very vigorous reaction at once ensues. A peculiar odor is developed, which, however, is not that of chlorine, although it might possibly be mistaken for it, but is apparently that of ozone. This is rendered evident by the immediate blue coloration of a strip of paper moistened with a solution of potassium iodide and starch when held over the vessel in which the reaction is taking place. If as soon as the reaction is completed the mixture be transferred to a filter, a quite colorless filtrate is obtained, possessing the peculiar odor above referred to, but which does not liberate iodine from a solution of potassium iodide, or at least not more than a very slight trace, and which therefore does not contain free chlorine. The energetic reaction which takes place when water is brought in contact with the respective mixed substances is due to the evolution of carbon dioxide.

It is probably well known that lead peroxide, although containing relatively a much smaller percentage of oxygen than manganese dioxide, gives up its oxygen much more readily than the latter to oxidizable bodies, especially in the cold. In the case under consideration the oxalic acid is simply oxidized to carbon dioxide and water, and essentially the same reaction takes place when lead peroxide and oxalic acid are brought together in contact with water.

$$H_2C_2O_4+O=2CO_2+H_2O.$$

In order to ascertain whether calcium or barium chloride suffer any change at all when present in this mixture, carefully weighed quantities of barium chloride, lead peroxide and oxalic acid, corresponding to the exact proportions represented by the previously mentioned equation, were brought in contact with a small amount of water, and, after the reaction had ceased, the mixture was brought on a filter and the residue washed with water. The liquid was found to contain 90 percent of the barium chloride employed, while but about 20 percent of the oxalic acid remained. It was thus evident that the barium chloride had remained for the most part undecomposed, a small portion having probably become converted into oxalate, while the greater part of the oxalic acid, as before stated, had become at once oxidized by the lead peroxide to carbon dioxide and water.

It therefore seems probable that the suggestion of Griggi concerning the extemporaneous preparation of chlorine water must have been based upon not very carefully considered theoretical conclusions, as expressed in the equation he has given, rather than upon results obtained by actual observation and experiment. It is, moreover, somewhat questionable whether the use of minium or of lead peroxide presents any great advantage over manganese dioxide for the preparation of even small amounts of chlorine water, especially if it be considered that by such an extemporaneous method as has been suggested the sodium sulphate contained in the solution would be likely in many cases to have a disturbing influence.

London, April 1897.

Some Cuban Medical Plants.*

By *Robert Combs*, Asst. Prof. of Botany, Iowa State College, Ames, Iowa.

Andira inermis Kunth. "Yaba." Native to tropical America. And *Andira microcarpa* Gr. Endemic to Cuba.

The seeds of these two species contain a bitter principle which produces the effects of a powerful emetic, and possesses vermifuge properties. It is dangerous in large doses. The bitter bark, in large doses, is very poisonous, but when used carefully acts as a vermifuge and febrifuge.

Its toxic action is that of a narcotic.

Tamarindus Indica L. "Tamarindō." No. 199. A native of India, but cultivated and naturalized in most tropical countries.

The legumes, tamarinds, enclose a sweet, very acid pulp, which possesses excellent refreshing, refrigerant and laxative properties.

It is used pharmaceutically in the preparation of confection of Senna. It is much used in Cuba in the preparation of "refrescos", refreshing drinks, like lemonade, etc.

Poinciana regia Boj. No. 84. "Flamboyant." A large and elegant tree introduced from Europe, cultivated much in gardens, etc.

Rhizophoraceæ.

Rhizophora Mangle L. No. 231. "Mangle colorado," Red mangrove. A very common tree, growing along the sea shore in the edge of the water.

It contains an abundance of tannin and is much used by dyers and tanners.

It is used medicinally as a hæmostatic and febrifuge. From incisions in the trunk of the tree a juice exudes, which when dry much resembles kino, both in appearance and properties. It is exported to Europe under the name of "Kino de America" or "Kino de Columbia" (American or Columbian Kino). The wood of this strange tree—strange because of its habitat and the germination of the seeds while still on the tree, a long heavy radicle being developed before falling and planting itself in the mud or water below—is utilized in various ways and because of its tough and durable qualities, is called in English regions by the significant name of "Horse Flesh."

Myrtaceæ.

Punica granatum L. "Granado" (Pomegranate). Introduced from Europe and Africa.

The astringent bark of this tree has long been known to be an excellent anthelmintic. It contains four alkaloids, two of which, pelleterine and isopelleterine, furnish the anthelmintic properties of the drug.

Psidium Guava Radd. No. 1. "Guayaba." A low tree common throughout the tropics in savannahs. It is of importance as the tree from whose fruits the commercial "Guava Jelly" is made. The fresh fruits are refreshing and refrigerant.

Passifloraceæ.

Passiflora Sp. Several species of the genus are used as garden and decorative vines.

Carica Papaya L. No. 110. "Papaya." "Fruta Bomba." Common both cultivated and wild.

From the plant is derived the celebrated vegetable pepsin called papaïn.

When an incision is made in the plant, the bitter latex runs out almost in a stream, and from this the digestive principle is obtained.

Besides papaïn the latex contains a great deal of vegetable fibrin and vegetable albumin.

Papaïn is useful in all cases where pepsin may be used and is much more reliable than pepsin on account of its permanence and uniformity of strength.

It is used quite satisfactorily, injected into cancerous tumors, ulcerous sores, lupus, etc., and in dissolving the false membrane of croup. Besides its medical value the fruit of the "Papaya" (Pawpaw) is used for food, as it possesses good nutritive value.

Cucurbitaceæ.

Feuillea cordifolia L. "Jabilla," "Sécua." A native of the West Indies. The seeds (called Sequa seeds) are very bitter and drastic and act as an emmenogogue. They owe their activity to a crystalline principle, isolated by Dr. Peckolt of Rio de Janeiro, called "feuillina."

It is also sometimes used as a febrifuge.

Rubiaceæ.

Exostemma caribaeum Roem. and Schult. No. 383. "Macagua de Costa," sometimes called "quina." A native of tropical America.

It is used as a substitute for quinine, whose properties it possesses to a great degree. It is reputed among the peasants as having febrifuge properties, but this is disclaimed by medical authority. The bark and green fruits are extremely bitter, disagreeable and nauseous, acting as a powerful emetic.

Other species of *Exostemma* (as *E. floribundum* R. S. and *E. ellipticum* Gr.) possess the same properties as the above.

Genipa Caruto Kth. No. 327. "Jagua." A native of tropical America. From the edible astringent fruits of "Jagua" a kind of wine is made, which is used in dysentery and as an antisyphilitic.

Genipa Americana L. Is known and used the same as *G. Caruto* Kth.

Richardsonia scabra L. No. 272. "Ipecacuanha blanca" (White Ipecac.). A native of the West Indies. The plant is important for its production of the genuine "White Ipecac" of the drug trade, so valuable as an emetic, etc.

Compositæ.

Trixis frutescens P. Br. No. 703. "Chiriqui." Native to tropical America. The plant is useful as a vulnerary applied to ulcers and wounds.

Ageratum conyzoides L. No. 59. "Mentrasto." Native to tropical America, but introduced into all tropical countries. It is a sudorific and febrifuge and is used in atonic conditions of the digestive track.

Mikania gonoclada DC. No. 683. "Guaco." The juice of this plant is used in nearly all the West Indies as an antidote to poisonous snake bites; however, as such it has no use in Cuba, for poisonous snakes are foreign to the fauna of that island.

It is used for digestive derangements, as diarrhœa and cholera.

Eupatorium villosum Sw. No. 525. This plant has been used like "Guaco" as a remedy for cholera.

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* Continued from p. 91.

Eupatorium ayapanoides Gr. "Ayapana." Indigenous to Cuba. It is corroborant and used in cholera morbus and as a febrifuge.

Nearly all the species of *Eupatorium* are aromatic, and *E. ayapana* Vent. is naturalized and cultivated for its diaphoretic properties.

Parthenium hysterophorus L. No. 250. "Escaba Amarga", Bitter broom. Tropical America. This bitter weed is used extensively as a febrifuge and for cranial neuralgia.

Its juice is useful as an external application to tubercular and syphilitic ulcers.

According to Dr. Ulrici of Havana, the plant contains an alkaloid, parthenine.

Bidens leucantha Willd. No. 432. "Romerillo blanco." All tropics. The plant is corroborant, sialagogue, emmenagogue and pectoral (?).

Lobeliaceæ.

Isotoma longiflora Presl. No. 34. A common weed in wet, shady places. Said to be one of the most poisonous plants in the West Indies.

Sapotaceæ.

Achras Sapota L. No. 136. "Sapate." "Nespero." Native to tropical America. This tree furnishes one of the most delicious fruits of the island.

From the abundant white latex a kind of guttapercha is made. The bark, "Cortex Jamaicensis," is astringent and febrifuge. The kernels of the seeds are bitter and contain hydrocyanic acid. Used effectively as a diuretic. The fruits are used against diarrhœa.

Chrysophyllum oliviforme Lam. Nos. 234 and 361. "Caimitillo." Damask Plum. Tropical America in savannahs, common. The bark of the tree is corroborant and astringent. The fruits have a sweet, agreeable taste, but are very astringent and when eaten in quantity cause gastralgia and constipation.

Chrysophyllum Cainto L. "Caimito." Same as the above. Fruits are called Star Apples in the British West Indies.

Apocynaceæ.

Allamana cathartica L. "Jazmin de la tierra" and "Barbero." Tropical America and India. The latex of this species is drastic and febrifuge. The leaves, in the form of an infusion, are cathartic and in large doses emetic and drastic.

Rauwolfia nitida L. No. 296. Native to the Antilles. The latex is very powerfully drastic, but possesses the disadvantage of producing great gastro-intestinal irritations.

Rauwolfia canescens L. No. 81. "Palo bonito." Indigenous to the Antilles. The latex of this shrub as well as that of one or two other species of *Rauwolfia* is acrid and poisonous.

Four gms. of the extract of the bark with 120 gms. of castor oil make an advantageous application in many chronic skin diseases.

Thevetia nereifolia Juss. "Cabalonga." Occurs in most tropical countries. Few plants are known which possess greater poisonous properties than this species. It owes its activity to two principles, thevetin and theverisin, both of which are energetic poisons. The former, thevetin, $C_{54}H_{84}O_{24}$, is a glucoside which is extracted from the seeds, but both principles occur in all parts of the plant, therefore all parts are poisonous, the seeds more active while the latex of the green plant is the most energetic.

Any part taken in large doses produces an abated pulse, horripilation with nausea, delirium, involuntary laughing, irregular convulsions, extreme agitation, singing, cries and talkativeness, fixed sight and finally death. No antidote is known.

Tabernæmontana citrifolia L. No. 18. "Pegojo," "Huevo de gallo." Indigenous to the Antilles. The bark of this shrub is corroborant and febrifuge, used internally and in baths. The latex is used as a caustic in treating warts, as a hæmostatic and in baths as a febrifuge.

Nerium oleander L. No. 207. "Adelfa." Original to Persia and N. Africa, but cultivated in most tropical countries in gardens and in colder climates as a green-house plant. It is the beautiful Oleander so much prized by lovers of potted plants. It is not generally known, however, to its admirers as one of the most poisonous cardiac paralyzants that exists.

Its strongest toxic properties seem to reside in its latex, that of the white flowered variety being most active. It is only used externally in skin diseases as carcinoma, etc.

The powdered leaves possess sternutatory properties.

Gentianaceæ.

Schultesia stenophylla Mart. No. 438. "Tabaco de sabana, flor rosado." Tropical America. This pretty little plant is a bitter tonic, corroborant and febrifuge. Several other Cuban members of this order, as *Eustoma exaltatum* Gr., *Enicostema littorale* Blume, *Voyria uniflora* Lam. and *Limnanthemum Humboldtianum* Gr., possess about the same properties as *Schultesia stenophylla* Mart.

Boragineæ.

Cordia globosa Kth. No. 450. This species and other members of the genus yield mucilaginous and emollient drugs. The berries of *C. alba* are edible.

Cordia geraschanthoides Kth. No. 717 and *C. gerascanthus* are valuable timber trees (Spanish Elm or Princes Wood).

Tournefortia gnaphalodes R. Br. No. 611 and *T. bicolor* Sw. No. 183. The flowers of these two species have exquisite odors, which might be utilized by perfumers.

Heliotropium Indicum L. No. 612. "Alacrancillo." Original to tropical Asia, but naturalized in most tropical countries. The plant is used as a vulnerary and in dysentery and hemorrhoids. Of the leaves an emollient poultice is made, useful in incipient anthrax.

Convulvulaceæ.

Ipomœa Quamoclit L. "Combustoria de hojas menudas." Original to India, naturalized in other tropical countries. The milky juice is sternutatory, the root is purgative.

Ipomœa Nil Roth. "Manto de virgin." Naturalized from India. The seeds are drastic and purgative like jalap.

Ipomœa Pes-capræ Sw. No. 614. "Boniato de playa." Most tropical regions on the sea shore. Used externally for arthritic pains and internally for gastric disorders.

Ipomœa Martinicensis Mey. No. 385. A native of the Antilles. Its tubers are cathartic.

Ipomœa cathartica Poir. No. 270. The tubers of this species are also cathartic.

Solanaceæ.

Solanum Melongena L. "Berengena." Indigenous to India. Cultivated in all tropical and subtropical countries for its large nutritive fruit called "Egg Plant."

Besides its nutritive value, the fruits are emollient and the leaves anodyne.

Capsicum baccatum L. Nos. 149 and 151. This species has the same properties and uses as *C. fastigiatum* Blume (Cayenne Pepper).

Scrophularineæ.

Herpestris Monnieria Kth. No. 381. "Graciola." It occurs in all tropical countries. In the form of a decoction, the plant is used as a diuretic and laxative; by some it is considered drastic.

Scoparia dulcis L. No. 191. "Escobilla." Common to all tropical countries. It has been used in gastro-intestinal troubles, but not satisfactorily, also in syphilis. It is astringent and as such the decoction of the root is used in the treatment of ureteritis, blennorrhagica, hemorrhoids, etc.

Capraria biflora L. No. 482. "Escabiosa." Original to tropical America. The infusion of the leaves is corroborant, digestive, stimulant and sudorific; in large doses it produces stupor and muscular paralysis.

Bignoniaceæ.

Bignonia unguis L. "Uña de gato." Tropical America. It is used as an antidote for poisoning by *Hippomane Mancinella* L., also as an antidote for snake bites.

Crescentia Cujete L. No. 9. "Güira," Calibash tree." Widely distributed throughout the tropics.

Dr. Peckolt of Rio de Janeiro has demonstrated that the pulp of the fruit is an excellent laxative, in small doses an aperient, in large doses an emetic. He says that the pulp mixed with water and vinegar is used as an emollient plaster in Brazil. In Cuba, the expressed pulp mixed with honey constitutes the "Miel de Güira," used in dressing wounds and contusions. It forms the basis of a proprietary medicine put up in Havana, called "Jaraba pectoral de Güira cimerone" (Pectoral syrup of wild gourd).

Dr. Peckolt discovered a new organic acid in this fruit, which he called crescentic acid. In addition, the fruit contains tartaric, citric and tannic acids, two resins, an aromatic and a bitter extractive, and a substance resembling indigo. The presence of tannin explains its efficacy in the treatment of diarrhœa and dysentery.

Acanthaceae.

Ruellia tuberosa L. No. 224, "Salta-perico." Throughout the tropics. The root and leaves are diuretic, purgative and emetic. The action is somewhat similar to ipecac. It is used in intermittent fevers, pneumonia, puerperal peritonitis, dysentery, etc.

Ruellia paniculata L. No. 702. A native of the Antilles. It possesses properties similar to those of *R. tuberosa* L.

Myoporineae.

Bontia daphnoides L. No. 497. "Bontia." Introduced from India. The flowers are emollient. The ripe berries furnish an emollient oil, which has vermifuge properties.

Verbenaceae.

Avicennia tomentosa Jacq. "Mangle blanco," White Mangrove. Indigenous to the northern part of South America, but naturalized on all tropical coasts.

A resin exudes from incisions in the bark, called "Manawa," which is used as an aliment. The green seeds cooked with the leaves of *Ipomœa campanulata* L. (not Cuban) are used as an emollient poultice.

The Arabs use the mucilaginous root of *Avicennia* as an aphrodisiac, which action is due to its corroborant properties.

Avicennia nitida Jacq. No. 80. "Mangle Prieto" (Brown or Black Mangrove). Of the same origin, occurrence and uses as *A. tomentosa* Jacq., and in addition is used as a febrifuge.

Nyctagineae.

Mirabilis Jalapa L. No. 286. "Maravilla de Perú." Indigenous to South America and Caribbean Islands. Cultivated in many countries as a garden plant, often naturalized.

It is commonly known in the United States as "four-o-clock." It has drastic properties as a medicine.

Bœrhaavia paniculata Rich. No. 104. Tropical America, Galapagos and Cape Verde Islands. A common weed in fields. It is used as a drastic drug somewhat similar to *Mirabilis*.

Amarantaceae.

Iresine celosioides L. No. 512. From the southern United States to Buenos Ayres. Called Juba's bush in Jamaica, where it is used as a stomachic by the negroes.

I know of no use being made of it in Cuba.

Other members of the order are emollient.

Chenopodiaceae.

Chenopodium ambrosioides L. No. 226. Warmer parts of America, Calif. to Chili. Naturalized in most warm parts of the world. The volatile oil contained in the seeds of this species and those of *C. anthelmintica* L. has excellent properties as an anthelmintic. (Called wormseed oil.)

Phytolaccaceae.

Petiveria alliacea L. No. 182. "Anamú." Native to tropical America. The root is antispasmodic, sudorific, diuretic, powerfully abortive, febrifuge and vermifuge; it is used in tooth ache, arthritic paralysis and dropsy.

Polygonaceae.

Coccoloba Uvifera L. No. 569. "Uvero." Indigenous to some of the Antilles. Common on the sea shore. The decoction of the bark and root is astringent, useful in diarrhœa and dysenteries. It formerly furnished what was called "Kino of Jamaica," but is not now on the market.

The fruits are edible.

Aristolochiaceae.

Aristolochia passifloræ folia Rich. No. 488. This as well as other Cuban members of the genus (*A. odoratissima*) are somewhat used as domestic medicines and possess much the same properties as our *A. Serpentaria*, *A. grandiflora* Sw., which is poisonous, being excepted.

Piperaceae.

Piper peltatum L. No. 514. "Caisimón." Tropical America. The whole plant is powerfully diuretic, especially the leaves and roots.

Piper umbellatum L. No. 7. "Caisimón." Tropical America. From the ripe, powdered seeds an oil has been obtained which has properties similar to oil of star anise. It, as well as the powdered seeds and infusion of the leaves, is used in atonic conditions of the digestive track.

Piper angustifolium L. No. 8. "Platanilla de Cuba," "Matico de Perú." Indigenous to tropical America. The leaves of matico are acrid, bitter, styptic and aromatic; they contain tannin, resin, a green volatile oil, a bitter principle (maticin) and a colorless crystallizable acid, matic acid. It is used in blennorrhagia, leucorrhœa, cystitis, impotency, hemorrhoids, etc. Externally it is used in the treatment of capillary hemorrhages.

Euphorbiaceae.

Pedilanthus tithymaloides Poit. No. 498. "Itimo real." Indigenous to the Antilles. The latex and seeds of this plant are irritant; the latex and root are noted emetics, emeto-cathartics and drastics; seeds emetic only.

The milk has been used locally in cases of carcinoma with good results.

Euphorbia pilulifera L. No. 2. "Yerba de la niña." Common weed throughout the tropics. This species is noted for its sedative effects in spasmodic conditions of the respiratory apparatus. It has been used with good results in asthma, the infusion in 1 gm. doses or the aqueous extract in 0.1 gm. doses being the most effective. It must be taken in an abundance of some vehicle to avoid its irritant action.

Hippomane Mancinella L. "Manzanillo," "Arbol del Diablo" (The devil's tree), "Pinipiniche." Tropical America. This dangerously poisonous plant has been proven[4] to be an energetic drastic, which in doses of 5–8 drops of the latex produces frequent evacuation. It is especially valuable in affections of the heart and in dropsy, when large amounts of serous matter are to be expelled. It is also diuretic.

In its use as purgative and hydragogue, much care must be exercised, as it is very poisonous in large doses and in unskilled hands is liable to prove treacherous. I have had several cases reported to me of peasants having taken "Manzanillo" as a purgative and died from its effects. The bark is used as a diaphoretic in cases of syphilis and as an antiphlogistic. The extract of the bark is used in treating intermittent fevers. For its poisonous effects, *Tecoma leucoxylon* Mart., *Bignonia unguis* L., *Jatropha gossypiifolia* L. and *Feuillea cordifolia* L. are used as antidotes.

Hura crepitans L. "Habá." Tropical America. The latex is very poisonous. Applied to the skin, it causes eruptive pustules resembling erysipelas. It owes its properties to an acrid crystalline principle called "hurine." The seeds of *Hura* are emetic and drastic.

Jatropha Curcas L. No. 100. "Piñon botija," Physic nut. Tropical America. The seeds of this species are effective purgatives. Several Cuban species of *Croton* yield aromatic barks, "Cascarillas."

(To be continued.)

Bismuth Subgallate and Subtannate.

By *Ferd. A. Sieker.*

About one year ago* the writer called attention to a simple method of distinguishing between these two salts. The subtannate is but "very slowly soluble in a five percent solution of sodium hydroxid but readily soluble in a boiling solution." "The subgallate dissolves almost instantly in a cold solution of sodium hydroxid." The original paper stated that it is very slowly soluble in a fifty (50) percent solution, but this is an error for a five percent solution (Liquor Sodæ, U. S. P.) was employed in this work. The behavior of these two salts toward a ten percent solution of crystallized sodium carbonate will also prove of service in distinguishing these two salts. Bismuth subgallate dissolves slowly in a solution of sodium carbonate at the ordinary temperature, but readily on the application of heat. The subtannate does not dissolve in a solution of sodium carbonate, even on prolonged boiling, but is decomposed. Bismuth subtannate was described as a canary yellow powder resembling the subgallate in appearance. On keeping, the salt gradually loses its beautiful color and assumes a dirty yellow color. The subgallate does not perceptibly change in appearance on long keeping.

Laboratory of Lehn and Fink, N. Y.

Notes on Several Fatty Oils.

By *Ferd. A. Sieker.*

The object of this paper is to describe briefly a number of fixed oils and to give a few tests, which may aid in their identification and in the determination of their purity.

Two of these oils have only a limited application in medicine, while the third (croton oil) is extensively used, but its constants (aside from specific gravity) do not appear to have been recorded. An analysis of these oils was not undertaken as this would have required the expenditure of much time, which was not at the writer's disposal. Especial attention is directed to the Hübl iodin number, which the writer generally applies in the determinations of the purity of fatty oils. If the iodin coefficient varies considerable from the limits of the normal figures, the oil is rejected. On the other hand the correct iodin number does not establish the purity of an oil for this must be verified by the application of other tests.

The following method[1] was applied in determining the amount of iodin the oils would absorb:

About 0.3 gm. of oil was brought into a 500 cc. flask provided with a glass stopper, 20 cc. of chloroform and 30 cc. of alcoholic iodin-mercuric chlorid solution was added and the mixture set aside for 24 hours. Twenty cubic centimeters of

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[4] Dr. A. Betancourt, "Revista de Ciencias Medicas," Havana, Nov. 9 and 20, 1888.

* Pharmac. Review 1896. p. 86.

[1] Helfenberger Annalen 1892, p. 3.

10 p. c. solution of KI and 200 cc. water were then added and the excess of iodin determined by titration with $\frac{N}{10}$ $Na_2S_2O_3$. The iodin mercuric chloride solution was of such strength that 30 cc. required about 50 cc. of $\frac{N}{10}$ $Na_2S_2O_3$. A blank experiment was in every case made side by side with the sample.

Oil of Saw Palmetto. Saw Palmetto (*Sabal serrulata*) is a shrub that grows very abundantly along the sea coasts of the southern States[2]. "The fruit is about the size of an olive, dark purple or brown in color, very succulent and contains a pit or seed similar to the olive." According to Sherrard the dried mature fruit contains from 12 to 13 p. c. of fatty oil and about ½ p. c. of volatile oil. The same investigator describes the fixed oil as follows: "There seem to be 2 fixed oils, one of a light lemon color, and the other of a tolerably deep green with a shade of brown." "A complete separation of these two oils was not effected; each upon aging and oxidation showed a decided crystaline deposit, the former assuming a marked rancid sweet oil odor and taste; the latter retaining its mild and not unpleasant bland butyraceous odor and taste." "The sp. gr. of the total fixed oil is .8851, the congealing point 11.5° C. and the melting point about 19.5° C." According to Prof. Virgil Coblentz[3] the pulp contains a small percent of volatile oil, a large proportion of fixed oil, a fat, etc. The seed yielded an additional 12.12 p. c. of fixed oil of a pale yellow color and sp. gr. 0.9103, bland and insoluble in alcohol. It is soluble in ether and chloroform and saponifiable by alcoholic alkalies, but not by aqueous potassium hydrate.

F. A. Sieker[4] found 12.2 p. c. of oil in a commercial fluid extract and 12.98 p. c. in a fluid extract prepared by himself from the ground dried mature fruit. These oils were perfectly soluble in alcohol and petroleum ether, but were not further examined.

An oil prepared in Oct. 1895 with the use of alcohol as a solvent was examined in March 1897. Besides oil the alcohol extracted "extractive" matter, from which the oil was separated by decantation and filtration. The color was deep green. The specific gravity was found to be 0.9138 at 15° C. and 0.9016 at 25° C. These determinations were made with the use of a 25 cc. pycnometer. The oil is soluble in alcohol and ether and almost perfectly soluble in petroleum ether. It congeals at about 14° C. Three cc. of oil mixed with two cc. of nitric acid (sp. gr. 1.138) and ½ gm. copper filings did not solidify after 3 or 4 days contact. The Hübl iodin number was found to be 41.86 (average of 2 estimations). The acid number was 175.26 and the ester number 37.23, which makes the saponification number 212.49.

This oil can be distinguished from most oils by its solubility in alcohol. Castor oil, which is soluble in alcohol, possesses the iodin coefficient of 84.4 (Hübl).

Another sample of saw palmetto oil (alcohol extraction) prepared March 1897, gave the iodin number 41.7. Another sample of oil extracted with petroleum ether in Aug. 1895 gave the iodin number 43.38. It was almost perfectly soluble in alcohol. The specific gravity was not determined because the sample was too small. The acid number was 149.13 and the ester number 68.32, which makes the saponification number 217.45. The acid number of these oils is therefore unusually high. As stated above these oils were not fresh when examined, but were kept in small almost filled bottles, which were securely corked and kept excluded from direct rays of the sun and at a temperature varying from 10 to 35° C. according to the season of the year.

Oil of Pumpkin Seed. This oil is prepared from the seed of *Curcubita Pepo*, Linné. The seed contains about 30 p. c. of oil, which is soluble in ether, petroleum ether, benzene and carbon disulfid, but insoluble in alcohol. The color is reddish yellow, when seen in thick layers.

The oil was prepared in February 1896 and examined in March 1897. The specific gravity was found to be 0.9231 at 15° C. (25 cc. pycnometer). With nitric acid and copper it did not solidify after 3 or 4 days contact. The iodin number was found to be 118.84 and 118.14 (2 estimations). The acid number was 29.04 and the ester number 165.77, which makes the saponification number 194.81.

A commercial sample of oil, which was in the writer's possession for about 15 months was also examined. It possessed a yellow color and was perfectly soluble in ether, petroleum ether, benzene and carbon disulfid, but insoluble in alcohol. Treated with nitric acid and copper it did not solidify even after 3 or 4 days. The specific gravity could not be determined because the sample was too small. The iodin coefficient was found to be 113.7, which is lower than that of the sample described above.

Croton Oil. The U. S. Pharmacopœia of 1890 describes this as "a fixed oil expressed from the seed of *Croton Tiglium* (nat. ord. *Euphorbiaceæ*)." According to Benedikt[5] croton oil differs from most oils in being devoid of olein and therefore does not solidify with nitric acid. It contains stearin, palmitin, myristin and laurin, also the glycerol compounds of œnanthylic, capronic, valerianic, butyric, crotonic and tiglinic acids.

A sample recently prepared by expression from the seed was examined with the following results: It is a thick yellow liquid possessing the specific gravity 0.9445 at 15° C. It is soluble in ether, carbon disulfid, petroleum ether and chloroform. Equal volumes of oil and concentrated sulfuric acid gave a clear dark brown mixture, but this is not characteristic. The iodine number was determined to be 107.02 and 108.01 (two estimations.) The acid number was found to be 14.99 and 14.72 (two estimations) and the saponification number 196.7 and 192.4 (two estimations). The color was however very dark after boiling with alcoholic caustic potash solution and therefore the saponification number could not be accuratly determined by direct titration. The method proposed by P. C. McIlhiney[6] for determining the Koettstorfer figure of dark colored substances was not applied.

A small quantity of crushed seed was exhausted with petroleum ether. The iodin number of the oil thus obtained, was found to be 110.6.

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[2] C. C. Sherrard, Proc. Am. Ph. Assoc. 1894, p. 311.

[3] Proc. Am. Ph. Assoc. 1896, p. 536.

[4] Pharmac. Rundschau 1895, p. 236.

[5] Analyse der Fette und Wachsarten von Dr. R Benedikt, p. 239.

[6] J. Am. Ch. Soc. 1894, p. 408.

MONTHLY REVIEW.

Commercial Reports.

Semi-Annual Report of Schimmel & Co. (Fritzsche Bros.), Leipzig & New-York.

NOVELTIES.

Cardamom Oil, Bengal. According to Prof. E. M. Holmes, Bengal cardamom is derived from *Amomum aromaticum* Roxb. and not from *Amomum subulatum* Roxb. as stated in Flückiger's Pharmacographia.

On distillation we obtained from Bengal cardamom 1.12 percent of a light-yellow oil having the sp. gr. of 0.920 at 15°, a laevogyrate rotation of — 12°41′ and a strong odor of cineol; it is soluble in one or more parts of 80 percent alcohol. The larger part passed over below 220° in a fractional distillation, leaving, however, a rather large residue. In order to ascertain the presence of cineol, some of the first fraction was diluted with 15 times its volume of petroleum ether and dry hydrobromic acid was passed into the mixture, properly cooling it. By subsequent decomposition with water, pure cineol was separated from the hydrobromic acid addition-product; the cineol had its boiling point at 175° to 176°, the sp. gr. of 0.924 and was optically inactive; after oxidation by means of potassium permanganate by the method of Wallach and Gildemeister*), it yielded cineolic acid, melting at 197°.

Ceylon as well as Bengal cardamom, therefore, contain cineol and both have some resemblance to each other in the odor; but the oil of Bengal cardamom will hardly ever find any practical use for want of the characteristic cardamom aroma.

Schinus Pepper-tree Oil. *Schinus molle* L., a tree indigenous to South America is commonly cultivated in Southern Europe on account of its graceful pinnate leaves and sweetly scented yellow racemes. A beverage, somewhat resembling wine, is prepared from its aromatic berries. In taste, they are first sweet, then spicy and finally sharp and peppery, wherefore they are much used in Greece in place of pepper. In odor, they resemble elemi, but at the same time recall the odors of pepper and juniper.

We distilled a lot of the berries received from Mexico and obtained 5.2 percent of a thin oil having the odor of phellandrene, the sp. gr. of 0.850 and an angle of rotation of + 46°4′; it furnishes a clear solution with several parts of alcohol.

When treated with sodium nitrite and glacial acetic acid in its solution in petroleum ether, the characteristic phellandrene nitrite is formed. When shaking the oil with Sodium hydrate solution, a small quantity of a substance which consists mainly of a fatty acid is obtained; only traces of phenols could be found.

Pepper-tree oil was examined in 1884 by Spica (Gazetta chimica 14, 204); he found pinene and a phenol which the author believed to be thymol on account of its nitrite, melting at 156°, but he failed to obtain this phenol in crystals, although thymol readily crystallizes.

According to the "Jahresbericht über Fortschritte der Pharmacie &c." 1887, p. 25, pepper-tree oil was obtained by Helbing by distillation of the berries with steam. He obtained 3.357 percent of oil.

Valerian Oil, Mexican. We recently distilled a lot of Mexican valerian roots which had a strong odor of valerianic acid but in their appearance little resembled the German root. We furnished Prof. E. M. Holmes in London with a sample of the root and he favored us with the information that three species of *Valeriana* grow in Mexico, all of which are used in medicine:—

1. *Valeriana mexicana* D. C., called in Mexico "cuittapatti". A sliced tubercular root 4 Cm. or more in diameter; it contains 0.91 percent of valerianic acid.
2. *Valeriana ceratophylla* H. B. K., called in Mexico "raiz del oso" and "jicama contra el tifo". A ligneous rhizome 20 to 30 Cm. long with a parchment-like periderm.
3. *Valeriana tolucana* D. C. "Mazatetes". Indigenous to the states of Mexico and Mechoacan; is very rich in valerianic acid.

Prof. Holmes is of the opinion that the sample sent to him belongs to the first named species, but a definite conclusion could not be arrived at for want of leaves and flowers, requisite for a botanical determination.

In distilling the root, we obtained a clear distillate free from any oil, and it was not before cohobation of the distillate that a slight oily separation was obtained, having the disagreeable pungent odor of valerianic acid.

The specific gravity of the oil is 0.949 at 15°, it is optically inactive and is entirely taken up when shaken with solution of sodium hydrate, leaving only a few flakes. Its figure of acidity was found by titration with alcoholic potassa solution to be 415, corresponding to 89 percent of valerianic acid hydrate, $C_5H_{10}O_2+H_2O$.

This species of Mexican valerian root therefore yields almost no oil at all, but only free valerianic acid. As the root has the odor of this acid in a marked degree, it seems that it contains the acid in its free state, so that it is not formed in the process of distillation.

CONTRIBUTIONS FROM THE RESEARCH LABORATORY IN GARFIELD, N. J.

Camphor-wood Oil, Venezuelan. We have received from Prof. H. H. Rusby of the New-York College of Pharmacy a lot of a Venezuelan wood in large blocks of a rather soft structure and of a faint odor of borneol; it readily splits and shows a silky lustre somewhat striated by darker longitudinal as well as latitudinal discolorations. For want of flowers and fruits, Mr. Rusby was unable to make a botanical determination, but supposes that the wood is derived from a *Nectandra* or *Ocotea* species (Lauraceae).

We obtained on distillation 1.15 percent of a light-colored oil of the very high sp. gr. of 1.155 and the opt. rot. of +2°40′ in a 100 Mm. tube. The oil has a faint odor of Canada snake root and solidifies to a crystalline mass at common temperature. When freed from any liquid portions by means of filtration and subsequently dissolved and recrystallized from alcohol, fine, colorless prisms are formed, melting at 28.5°. The crystalline mass is soluble with dark-red color in concentrated sulfuric acid; when this solution is poured into water, brown flakes are separated. When boiled with an alcoholic solution of potassium hydrate, a compound is formed, crystallizing from its alcoholic solution in fine plates melting at 55° to 56°. These products and reactions are conclusive that the crystalline part of the Venezuelan camphor-wood oil, amounting to about 90 percent, consists of apiol, which, on further observation, proved to be identical with common parsley apiol.

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*) Annalen der Chemie 240, 208.

Clove Oil. In the course of our examinations of this oil we have isolated quite a large quantity of furfurol, well characterized by its reactions (phenylhydrazone, color-reaction with aniline and glacial acetic acid, and separation into furfurolalcohol and pyromucic acid.) The problem, however, still remained, what constitutes the principle of the particular fruit-etherlike flavor characteristic of oil of cloves and absent in mixtures of eugenol, caryophyllene and furfurol. This special flavor is particularly noticeable in the first fractions of the oil and we have separated, by fractionation in a vacuum, the most volatile portions from large quantities of oil of cloves. We found that besides furfurol other constituents are present which readily combine with bisulfite, but these compounds could not well be separated on account of their mucilaginous properties. The main part of the most volatile fraction boiled at 150° to 155°, but could not be entirely separated from furfurol before purifying it by shaking it with cold potassium permanganate solution, when it obtained a constant boiling point of 151° to 152°. An elementary analysis resulted in the formula $C_7H_{14}O$. It has a marked fruit-ether flavor and when added in a trace to a mixture of eugenol and caryophyllene at once imparts to it the characteristic clove aroma. This compound is little affected by oxidizing agents, but is gradually transformed into valerianic and acetic acid and traces of capronic acid by warm chromic acid mixture.

This result and the boiling point indicate the presence of normal-amyl-methylketone, $CH_3(CH_2)_4CO.CH_3$, as yet not observed as a constituent of essential oils. It is present only in so minute a quantity that one should hardly suppose that it could exercise such a marked odoriferous influence, but observation proves that this is the fact in this as well as in other essential oils with principles extremely volatile and present only in the most minute quantities. Other instances of this kind are the secondary constituents of the natural wintergreen and betula oils and the dimethylsulfide of the American peppermint oil, which by insignificant changes in their quantity can essentially alter the odoriferous character of these oils.

Besides methylamylketone, minute quantities of other compounds of inferior odoriferous significance, with a lower boiling point than eugenol, are contained in oil of cloves. We shall report on them later on.

Goldenrod Oil, Canadian. The oil of *Solidago Canadensis* was distilled by us in 1894 and its physical constants were stated in our Report of April 1894. A recent examination of the oil in our research laboratory has shown it to consist of 85 percent of terpenes, mainly of pinene and much less of phellandrene and dipentene, and perhaps also to contain some limonene. The portions having a higher boiling point consist of borneol and bornyl acetate and some cadinene. The total amount of borneol contained in the oil is 9.2 percent, of which 3.4 percent are acetate.

It is remarkable how closely the chemical composition of this oil approaches that of the needles of the *Pinus* genus, although both are so widely different in their botanical relations.

Spearmint Oil. Our spearmint plants had sufficiently developed since the first cut in July to permit a second one at the beginning of October. While the first crop had yielded 0.3 percent of oil this one realized only 0.18 percent; and the oil was less fine in odor and had a lower specific gravity and rotatory power, namely 0.961 and — 37°20′ against 0.980 and — 42°30′ of the oil of the first crop, whilst no fraction of oil heavier than water was noticed.

We are enlarging our spearmint fields this season and will again distill the herb in the progressive stages of its growth so as more closely to study its composition at these various stages.

Wormwood Oil. Only one constituent of this oil has as yet been determined, namely thujone, while small quantities of terpenes were supposed besides to be contained in the oil. The purity of the oil was thus far estimated by its specific gravity. In order to attain to some more definite tests, we have examined wormwood oil distilled by us in October 1895. It was of a dark-green color and had the sp. gr. of 0.932. By liberal treatment of its alcoholic solution with solution of sodium bisulfite, the greater part of thujone was separated and the remainder boiled with an alcoholic solution of sodium hydrate. After the alcohol had been removed by distillation, the saponified oil was separated by means of steam, leaving behind a considerable thick oily residue, partly soluble in ether. The insoluble part proved to consist of a sodium salt of an acid, which was recognized by its melting point as well as by the analysis of its silver salt to be palmitic acid. The aqueous salt-solution, remaining from the saponification, was neutralized with sulfuric acid, evaporated to dryness and the acids contained therein transformed into the corresponding esters; these, again, were separated by fractional distillation. As is the case with most esters contained in essential oils, the mixture of acids consisted of acetic and a little insovaleric acids.

The oil obtained by steam was several times distilled in a vacuum, and the portion having a lower boiling point was subsequently distilled under common pressure. A very small fraction boiling between 158° and 168° was thus obtained, containing phellandrene; an effort to ascertain the presence of pinene failed on account of the insufficient quantity of the fraction of the distillate, but in trying to obtain pinene nitrosochloride the characteristic blue reaction and a slight crystallisation were observed.

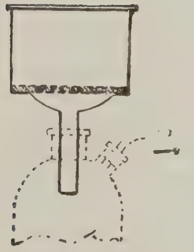
The quantity of terpene present is in any case an extremely small one, so much so that any adulteration with oil of turpentine can be easily ascertained. This is done by distilling from a sample of the wormwood oil about 10 percent, this distillate should render a clear solution with 2 parts of 80 percent alcohol. This simple test has proved a reliable one; we have examined a large number of commercial oils of wormwood and found them sophisticated in every case when the first fraction of the distillate failed to produce a clear solution with alcohol.

The fraction of oil passing over at 200° to 203° was found to consist of thujone; this could not be completely removed from the original oil by treatment with bisulfite, but it was fully identified thereby, as well as by obtaining its tribromide melting at 121° to 122°; but neither of these compounds could be obtained from the next fraction distilling at 210° to 215°, which upon acetylisation and saponification proved to be of an alcoholic nature. By careful oxidation with chromic acid mixture we succeeded in transforming it almost completely into thujone. The results of this examination, therefore, bear evidence to the presence of thujyl (tanacetyl) alcohol.

By a quantitative saponification of the original as well as of the acetylized oil, we have, furtheron, determined the amount of thujyl alcohol and acetate, and found it to be 17.6 percent of thujyl acetate, corresponding to 13.9 percent of thujyl, so that the total quantity of thujyl alcohol (free and as ester) contained in the oil is 24.2 percent.

Pharmaceutical Technique.

Suction Filter.*



A new form of "Nutschenfilter," invented by Dr. Ackermann, is shown in the accompanying figure. It is made of porcelain and has the advantage over similar filters in that the filter-plate can be taken out and readily covered with straining cloth, filter-paper, or other filtering medium. The apparatus is attached to a suction flask by means of a perforated rubber stopper.

Comminution-Mill.*

The mill shown in the accompanying illustrations is intended to furnish a strong yet not too expensive comminution apparatus for technical laboratories. It consists of a very heavy iron mill-work *a*, and an iron vessel *b*, in the middle of which a slightly conical grooved tougue *c* passes through the centre of the hopper *f*. The arms *d* and *e* are fastened to opposite points of the mill-work.

Fig 1

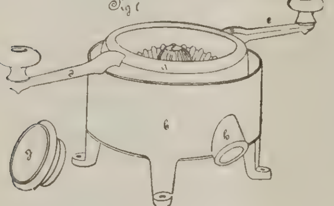
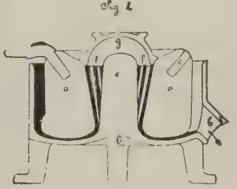


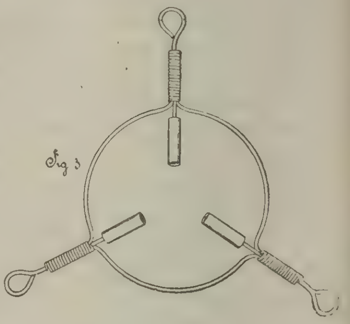
Fig 2



The substance to be comminuted is well dried, placed into the hopper *f*, the handles inserted, the cover *g* fastened and the handles moved forward and back. As soon as the larger pieces have been crushed, one of the handles is removed and the other turned in a circle (like the handle of a small coffee-mill) until all the material has been forced out of the mill through the lateral opening *b*. The mill can be firmly screwed to a table and is easily cleaned with a brush.

An Adjustable Crucible-Holder.*

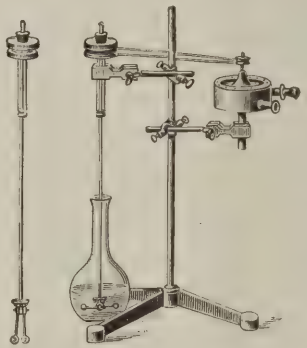
Fig 3



In this apparatus as seen in Fig. 3, the crucible hangs in the space between three clay rods, which are fastened to wires. These wires can be moved forward and back so that the circular space between the points can be changed from 3—5 cm. in diameter, and so furnishes room for crucibles of various sizes.

A New Stirring-Apparatus.

This "Intensiv-Rührer" has been patented in Germany by Hermann Schultze and placed on the market by C. Gerhardt of Bonn on the Rhein. As the accompanying illustration shows, it consists of a glass rod, which can be rapidly rotated in the usual manner, and on whose lower end two hollow glass balls are so fastened by means of heavy platinum-iridium wire as to be movable. Ordinarily these hang vertically, but upon immersion into liquids they are buoyed up into a horizontal position. This simple device results in the following advantages: Firstly, the stirrer can readily be introduced into vessels of any shape, round-bottomed flasks being especially recommended since in these the stirring action is most intense. Secondly, the efficiency of the stirrer is remarkable. Using it in connection with a *Rabe's* turbine with 3.5 atmospheres water-pressure, 1.5 litres water and 200 g. benzol were so thoroughly emulsified, that even after 6 hours standing complete separation had not taken place, while with the use of other stirrers, under like conditions, the liquid became clear in 5—15 minutes.

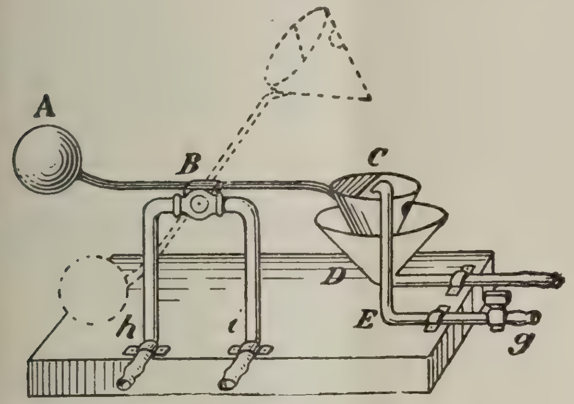


The "Intensiv-Rührer" is of special advantage, when the depth of the liquid is slight, when the liquid has become pasty due to the formation of a precipitate, when a rapid motion of the surface is desirable as upon the gradual addition of some other substance, or when an oil, floating upon the surface of the water is to be emulsified. The stirrer is about 40 cm. long, but is furnished in any length desired.

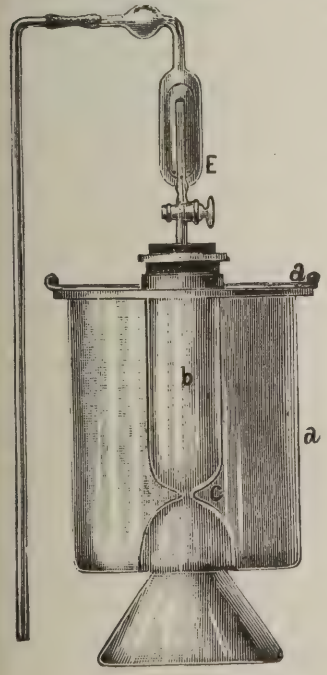
An Automatic Gas-Stopcock.*

This new apparatus, invented by Dr. Hugo Michaelis, is applicable wherever simultaneous water and gas supply is desired; as e. g., in working with a constant-level water-bath, or in heating a vessel with a reflux condenser. In case of accidental shutting off of the water supply, it prevents overheating of the bath, or evaporation of volatile vapors through the condensor, respectively. The apparatus is entirely automatic so that an experiment can be carried on without any attention.

The apparatus works as follows: Tube *g* is attached to a faucet close to the one which connects with the water-bath or condenser; or still better, to the same faucet by means of a T-tube. The water flows through *g* into the funnel *C* which has an orifice at the bottom to let out the water, but always less than flows in. The excess flows into the exit-funnel *D*. Funnel *C* is attached to one arm of a lever, which is fastened to the gas-cock *B*, while at the other end of the level is situated the counterpoise *A*. As long as *C* is filled with water, i. e., as long as water is running, the lever is in a horizontal position and the gas-cock is open. As soon as the water-supply ceases, the funnel is gradually emptied until the weight *A* moves the lever into the position indicated by the dotted lines; hereby the gas-cock is closed, and the flame is extinguished.



A New Gas-Generator.*



This apparatus, which was invented by Dr. Voeller, serves for the generation of Cl, H, SO_2, H_2S, CO_2 etc. As seen from the accompanying figure it consists of a cylindrical glass vessel of about 3 l. capacity, whose lower end is contracted and again widened so as to assume the shape of a Scheibler's desiccator. This vessel holds the acid. The substance to be acted upon by the acid is placed into another cylinder of about 700 cm. capacity, which is also drawn in near the bottom to about 2.5 cm. and then widens out into an open bell, 5 cm. high and 8 cm. wide. The opening at *c* is either closed with a perforated stopper or covered with broken glass to prevent the falling of any of the substance into the acid. The upper opening of the cylinder is closed with a rubber stopper, through which passes the exit-tube. Upon opening the stop-cock the acid rapidly rises into the cylinder, but can be so regulated as to attack only the lower portions of the material in the cylinder. The resulting salt solution, being heavier, sinks and fills the space beneath the inner cylinder. Upon closing the stop-cock the acid is forced back, and the subsequently developed gas fills the bell-shaped extremity of the cylinder. The exit-tube can be directly connected with a gas washing apparatus as shown in the figure.

Chemistry.

An Analytical Investigation of the Hydrolysis of Starch by Acids.

Few problems of commercial analysis have been so complicated and so discouraging as that of the determination of the components of starch conversion products. The well-known schemes of commercial analysis of worts and similar products of the action of diastase are based on the assumption that but two simple compounds are formed from starch—maltose and dextrin. In the case of glucose syrups and starch sugars, which are the results of acid hydrolysis, it is known that the reaction proceeds farther, as dextrose is formed from the maltose and dextrin.

Musculus and Gruber[1] decided that these reactions went on together, so that, except at the very beginning or final stage of hydrolysis, all of these compounds must be present in solution.

The analysis of acid-converted starch products must, therefore, take in consideration the presence of the third compound, dextrose.

Much doubt, however, has been thrown on the accuracy of such analysis, as during the past twenty years the researches of O'Sullivan, Brown, Heron, Morris, Bondonneau, Herzfeld, Musculus, Bruckner, Fischer, and other distinguished investigators, have shown that not only the simple compounds referred to can be isolated from starch products, but also many other of quite distinct optical and chemical properties. Space will not permit a review of this work, which is in many points conflicting. The recent conclusion of Lintner and Düll is that the following compounds result from hydrolysis[2]:

Hydrolysis withoxalic acid: Amylodextrin, erythrodextrin I, erythrodextrin II a, erythrodextrin II b, achroodextrin I, achroodextrin II, isomaltose, dextrose; with diastase: amylodextrin, erythrodextrin I, achroodextrin I, achroodextrin II, isomaltose, maltose.

Others, as Brown and Morris,[3] deny the existance of the isomaltose of Fischer, Lintner, and Düll, and mention another compound, maltodextrin, as intermediate between dextrin and maltose.

In 1885, Brown and Morris[4] discovered the remarkable law that at any stage of the conversion of starch, by diastase, the total product, in its optical properties and relation to Fehling's solution, behaved exactly as if made up of two compounds only, maltose and dextrin, so that it was possible by taking the rotatory power to calculate at once the cupric reducing power if the total carbohydrates were known. This law indicated that, however, complicated the bodies isolated, they could be considered as existing in solution as two simple compounds, and did much to establish the validity of the principles of the usual commercial analysis of worts and similar products.

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* These apparatus have been placed upon the market by Max Kaehler & Martini of Berlin.

[1] Bull. Soc. Chim., 2, 30.

[2] Berichte 28, 1522—1531.

[3] J. Chem. Soc., August '95.

[4] Annalen 231, 131.

The method of analysis of glucose syrups and starch sugars implies the assumption of a similar law, but the proof that this law actually exists under varying conditions of hydrolysis apparently has heretofore not been worked out.

Rolfe and Defrew have recently made investigations, first, to determine whether there was any simple constant relation between the optical rotation and the cupric reducing powers of starch products hydrolyzed under different conditions; and secondly, whether any laws could be found affecting the three simple bodies assumed to be formed and determined by the usual methods of analysis. Incidentally they collected some data as to the speed of hydrolysis, influence of carbohydrates on specific gravity of solutions, and some looking to a more rapid and accurate method of determining cupric reducing power of Fehling's solution.

In the calculation of total solids, these were determined from the specific gravity on the assumption, first laid down by Balling and Brix and corroborated by the authors, that 1 g. of mixed carbohydrates in 100 cc. of solution increased the specific gravity by 0.00386. This factor was found exact for approximately 1070 solutions of cane sugar, and nearly so, for solution of the products of starch conversion.

The results pointed to the remarkable fact that the cupric reducing power of the total product bears a constant relation to the specific rotatory power, even when the starch is hydrolyzed under widely varying conditions; as, e. g., when using different acids, different amounts of starch, or when varying the temperature, pressure and time of action.

From the results as a whole, Rolfe and Defrew conclude that the evidence is strong: (1) That in any homogeneous acid-converted starch product, irrespective of the hydrolysis, the specific rotatory power always represents the same chemical composition. (2) That but three simple carbohydrates, possibly in molecular aggregates, exist in the solution of a starch product hydrolyzed by acids. [Techn. Quart., 10, p. 133.]

Eucaïne A.

The older eucaïne, which is now designated eucaïne A in distinction from eucaïne B (p. 77), was briefly mentioned (p. 37) as a new local anaesthetic introduced last year. According to more recent reports it is prepared in the following manner: Hydrocyanic acid is added to triacetonamine, a condensation product of acetone and ammonia, and the cyanhydrin is hydrolized. In the resulting acid the hydroxy hydrogen is replaced by a benzoyl group, and the carboxyl hydrogen and imide hydrogen are replaced by methyl, benzoyl-μ-methyl tetramethyl-γ-oxypiperidine carbonic acid methyl ester resulting. The free base is sparingly soluble in water, readily soluble in alcohol, ether, chloroform, benzene. The large crystals from the ethereal solution melt at 104—105°. With acids it forms neutral salts.

The hydrochloride, $C_{19}H_{27}NO_4.HCl.H_2O$ crystallizes from water in scales or tablets and is soluble in water to the extent of 9 to 9.5 p. c. The solution can be boiled without decomposition. Ammonia, the fixed caustic and carbonated alkalies precipitate it as a gummy mass. With a few drops of a 5 p. c. chromic acid solution its aqueous solution forms a lemon-yellow crystalline precipitate. A 1 p. c. solution (5 ccm.) with a 10 p. c. potassium iodide solution (3 cm.) yields first a milky turbidity, then a magma of crystalline hydriodide.

It is compatible with antiseptics; e. g. phenol, trikresol, guaiacol, naphthol, resorcinol, salol, ichthyol, formalin, iodoform; with hydrocarbons, such as ligroin, petroleum, vaselin, benzene, toluene; with fats and oils; with volatile oils, camphors and terpenes; with lanolin; with alcohols, incl. glycerol; with esters such as acetic ether and gaultheria oil; with chloroform, chloral and chloral hydrate; with alkaloids such as quinine and morphine, also alkaloid like substances like antipyrine, phenacetine; with all sugars.

For the production of anaesthesia on mucous membranes and on painful wounds Prof. Liebreich recommends an ointment prepared from one part of eucaïne hydrochloride A, 2 parts olive oil, and 7 parts lanolin. [Pharm. Centrh. 38, p. 281.]

Lactic Acid Fermentation.

Certain bacteria which show considerable resistance toward heat, Miquel has designated thermophilic (from (from ϑεςμός, warm, and φίλος, friend). Cambier has studied the action of such toward fermentable substances. A peptone nutrient solution, to which 10 p. c. glucose and calcium carbonate had been added, was inoculated with garden soil, and the mixture kept in a thermostat at 70°. Soon carbone dioxide with traces of hydrogen were given off and continued to be eliberated until the solution no longer reduced Fehling's solution. Only traces of an alcohol distilled over and the residue contained calcium lactate. The conversion of the glucose into the lactic acid was almost quantitative. The carbon dioxide had been liberated from the calcium carbonate.

[Pharm. Centrh. 38, p. 294; from Chem. Ztg. Rep. 1897, p. 85.]

Guaiacol Phosphide.

This compound of phosphorus and guaiacol is prepared by Ballard as follows: 124 g. of crystallized guaiacol are dissolved in a solution of 50 g. caustic soda in 90 p. c. alcohol. To the clear solution phosphorus trichloride is added until the solution is no longer alkaline to phenolphthaleine. The precipitated salts are removed by filtration, the alcohol from the filtrate by distillation and the residue is extracted with absolute alcohol. The solution is evaporated on a water bath. The crystallized product is recrystallized from absolute alcohol and finally dried over sulphuric acid. The crystals have the formula $P(C_6H_4:OCH_3).O)_3$, and melt at 77.5°. Creosote treated in a similar manner gives a thick reddish-yellow liquid which consists of the phosphorous compounds of the various phenols present in the creosote. To this the author proposes to give the name phorphatol.

[Pharm. Journ., 1897, p. 368; from Rep. de Pharm. [3], 9, p. 104.]

The Distribution of Alkaloids.

The following list is taken from Einführung in das Studium der Alkaloide (pp. 39 and 124), the German translation by Dr. Hermann Kunz-Krause of the Italian work of Dr. Icilio Guareschi, Director of the Pharmaceutical-chemical Institute of the University of Turin. Many of the alkaloids enumerated are found in more than one plant. Thus berberine has been isolated from more than twenty plants representing from five to six natural orders. As a rule only that plant is mentioned from which the alkaloid is primarily prepared. However desirable a more complete list in this respect might have been, the following enumeration is by no means devoid of interest. Those who desire to know more about the individual alkaloids, will have to be referred to the original. The chapter on plant alkaloids, or alkaloids proper covers no less than 140 quarto pages of the monograph.

I. Kryptogams.

Fungi.

Agarythrine —, Agaricus ruber.
Choline, $C_5H_{15}NO_2$, Agaricus muscarius, Boletus luridus, Claviceps purpurea, etc.
Ergotinine, $C_{35}H_{40}N_4O_6$ (?), Claviceps purpurea.
Muscarine, $C_5H_{15}NO_3$, Agaricus muscarius L.

Lycopodiaceæ.

Lycopodine, $C_{32}H_{52}N_2O_3$, Lycopodium complanatum L.
Pillijanine, $C_{15}H_{24}N_2O$, Lycopodium Saururus Lam.

I. Phanerogams.

A. Gymnoperms.

Coniferæ: Taxineæ.

Taxine, $C_{37}H_{52}NO_{10}$ (?), Taxus baccata.

Gnetaceæ.

Ephedrine, $C_{10}H_{15}NO$, Ephedra vulgaris, var. helvetica.
Pseudoephedrine, $C_{10}H_{15}NO$, species unknown.
Ephedrine, $C_{13}H_{19}NO$, Ephedra monostachia.

B. Angiosperms.

1. Monocotyls.

Amaryllidaceæ.

Amarylline, —, Amaryllis formosissima.
Belamarine, —, “ “

Araceæ.

Choline, $C_5H_{15}NO_2$, Acorus Calamus.
Calamine (methylamine) (?), CH_3NH_2, Acorus Calamus.

Gramineæ.

Avenine, —, Avena sativa.
Soliine, —, Solium temulentum.
Temulentine, —, Solium temulentum.

Liliaceæ. a. Lilieæ.

Imperialine, $C_{35}H_{40}NO_4$ (?), Fritillaria imperialis.
Tulipine, —, Tulipa gesneriana.

b. Melanthieæ (Colchicaceæ).

Colchicine, $C_{22}H_{25}NO_6$, Colchicum autumnale.
Colchiceïne, $C_{21}H_{23}NO_6 + \frac{1}{2}H_2O$, Colchicum autumnale.
Cevadine, $C_{32}H_{49}NO_9$, Veratum Sabadilla.
Cevadilline, $C_{34}H_{53}NO_8$, “ “
Veratrine, $C_{37}H_{53}NO_{11}$, Veratum Sabadilla.
Sabadine, $C_{29}H_{51}NO_8$, “ “
Sabadinine, $C_{27}H_{45}NO_8$, “ “
Jervine, $C_{26}H_{37}NO_3$, Veratrum album.
Rubijervine, $C_{26}H_{43}NO_2 + H_2O$, Veratrum album.
Pseudojervine, $C_{29}H_{43}NO_7$, “ “
Protoveratrine, $C_{32}H_{51}NO_{11}$, “ “
Protoveratridine, $C_{26}H_{45}NO_8$, “ “

c. Smilaceæ.

Majaline, —, Convallaria majalis.

Palmæ.

Apirine, —, Cocos nucifera and C. ladidea.
Arecaïne, $C_7H_{10}NO_2 + H_2O$, Areca Catechu.
Arecaïdine, $C_7H_{11}NO_2 + H_2O$, “ “
Arecoline, $C_8H_{13}NO_2$, “ “
Choline, $C_5H_{15}NO_2$, “ “
Guvacine, $C_6H_9NO_2$, “ “

2. Dicotyls.

Anacardiaceæ.

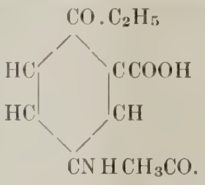
Loxopterygine, $C_{26}H_{34}N_2O_2$(?), Loxopterigium Lorentzii.
Picramnine, —, —.

Anonaceæ.

Asimine, —, Asimina triloba Adin.

Benzacetine.

(Phenacetine carbonic acid, Acetamidosalicylic acid).



This substance forms needle shaped crystals and is slightly soluble in water and freely soluble in alcohol. It fuses at 205° C. Benzacetine combines with bases and forms salts, such as lithio-benzacetine, which are freely soluble in water.

Pure benzacetine, as well as its lithium compound, have been shown by the experiments of Frank (Centralblatt für Gynaekologie 1894, No. 35) to be powerfully antinuralgic and have proved very beneficial in many cases without adducing objectionable secondary phenomena. Pure Benzacetine given in doses of 0.5—1.0 grm. (gr. 8—16) is particularly valuable as a sedative in sleeplessness and in certain excited conditions of nervous hysterical and anaemic women where it is desirable to avoid narcotics. A. Reiss (Therap. Monatsh-1896, June) has obtained very satisfactory results by administering benzacetine, coffeïne and citric acid, especially in chronic cases of habitual headache, neuralgia and migraïne in mental patients and others, but he did not derive any benefit from the use of benzacetine as a soporific.

Testing of Quinine.

O. Hesse contributes a second paper on Kubli's method for testing quinine which is intended as a refutation of objections made by Kubli to his first paper. In order to understand the situation of both men, Kubli's articles in the Pharm. Zeitschr. f. Russl. as well as Hesse's first article in the Archiv for 1896 would have to be consulted. The last paragraph by Hesse was certainly not written in a scientific spirit.

[Arch. f. Pharm. 235, p. 114.]

Botany and Pharmacognosy.

Cultivation of Peppermint in Russia.

Considerable attention is given in Russia to the culture of *Mentha piperita*. In the district Rostow alone in one year about 16 million kilos of the herb were gathered. The best mint comes from the neighborhood of Wanow. The collection of the ethereal oil is carried on in the most primitive manner, the result being a small yield of an oil unsatisfactory in quality.

[Pharm. Post, 1897, p. 218.]

Cultivation of Sumbul in England.

Mr. E. M. Holmes believes the sumbul root of the market at the present time not to be the true musk root from *Ferula Sumbul*, but the product of a related species. Sumbul of present market consists of smaller, more cylindrical pieces than the true article, with a faint musky odor instead of the fragrance characteristic of the drug of twenty-five years ago. The upper part of the root stalk of the present drug is often branched, something not seen in the true sumbul which in the upper portion tapers to a rounded fibrous apex. The texture of true sumbul is not so firm as that of the root now sold.

Mr. Holmes is cultivating true sumbul plants and contributes valuable information. The fleshy roots in autumn lose their small rootlets and can then be safely transplanted, new rootlets appearing the following spring. In February or March, as soon as the ground is no longer hard from continued frost, one or more young leaves are sent out. The fully developed leaves appear in April and grow until July when they turn yellowish and gradually wither. The root increases in size every year, retaining its oval form presumably until it attains a sufficient reserve of nutrition to enable it to send up the large fruiting stem. The inflorescence of a specimen that bloomed in the Kew Gardens some years since reached a height of 8 feet, when the plant died.

Mr. Holmes' plants, now 6 years old, have not flowered. A root dug not long since was 6 inches long and 3½ inches in diameter, with a strong, persistent musky odor when injured, exuding a white, milky juice. The rootlets are somewhat twisted and spread nearly horizontally in the soil. It is obvious from the shape that such a root might furnish one cylindrical and two tapering sections of the thickness of the old-fashioned drug; the cylindrical pieces 2 or 3 inches long of the present day are out of the question.

If good seed could be obtained, sumbul could doubtless be cultivated in temperate regions without difficulty. It is hard to obtain good seed, since the fruits are very liable to injury by rain.

[Pharm. Journ. 1897, p. 347.]

Chicle Gum and its Use.

Mr. Edward N. Butt communicates some interesting facts obtained in his travels concerning the collection and use of the chicle gum derived from *Achras sapota* L., a tree growing wild in the forests of Yucatan and the adjacent states of Central America. While indigenous from Mexico to Guiana, it is extensively cultivated in tropical countries. It produces a valued edible fruit.

In the states of Yucatan and Campeche, the peons, the lower class of natives, select in the forest trees sufficiently mature and cut V-shaped incisions in the stem. The juice which exudes soon becomes indurated by exposure to the scorching heat of the sun and the gum in this form is collected. The trees are then allowed to rest for four or five years, after which period they are again fit to undergo the tapping process. When a sufficient quantity of the crude gum has been collected, it is pressed into thick, oblong blocks, which weigh from twenty-five to thirty kilos each. The collector then turns over the stock to the merchants. The exporter usually packs three of these blocks in a bale, the average weight of each bale being about eighty kilos. In the year 1895 no less than four million pounds of chicle gum of an estimated value of one and one-half million dollars, was imported into New York from Mexico. In the United States it serves as a basis for the manufacture of chewing gum.

Concerning the circumstances leading to this use of the gum, Mr. Butt tells an interesting story. A quarter of a century ago, chewing gum in the United States consisted in the main of two kinds, prepared spruce gum and shoemaker's wax. A little later, a preparation of paraffin wax was introduced. Chicle gum was first used for this purpose about fourteen years ago. A lot of this Mexican gum was sent to New York on board ship, partly as balast and partly in the hope that it might be found useful to bookbinders or serve some purpose in the leather trade. After several trials, no use could be found for it and in the absence of any purchaser, it was decided to tow it out to sea and throw it overboard to get rid of it. Just at this time, one of the many men standing on the wharf casually picked up a piece and found it would "chew." It occured to him that it might serve as a basis for a new chewing gum. The experiment was a success in every way, and an immense business grew from it.

[Pharm. Journ. 1897, p. 328.]

Cinchona Cultivation in India.

The last report on the cinchona plantations of Bengal (Planters' Gazette of India, Dec. 1896) states that the present object of the government is to provide, without actual loss to itself, a cheap fever-remedy for the people of India; the capital cost of the plantations having been paid off some time ago, it is no longer necessary to sell at a profit.

With the exception of small quantities supplied to the medical depots and government-institutions, the whole of last year's crop, amounting to 467,190 ℔ of bark, was handed over to the quinine factory; 170,000 ℔ in addition was bought from various tea companies in Darjeeling. From this were produced 9,004 ℔ of quinine sulphate and 3,124 ℔ of "cinchona febrifuge." There has been an increase of 2,725 ℔ in the issue of quinine sulphate, partly owing to the demand for pice packets to be sold through the post-offices, and partly to the demand in connection with the Chitral expedition. At the end of the year there remained in stock 2,357 ℔ of quinine sulphate.

The scheme for the sale of quinine through the post-office department makes steady progress and the demand is increasing with such rapidity that it has been necessary to limit the sales in Bengal and Assam and to discontinue the supply to other provinces.

As a further satisfactory result of the operations it appears from the Sanitary Commissioner's report that there is a general correspondence between fever mortality and the demand for quinine.

The severe drought of last year has had a very damaging effect upon the young seedlings with which the plantations were to have been extended, but, on the whole, the Lieutenant-Governor considers the results obtained are entirely satisfactory.

[Journ. Imp. Inst., 3, p. 155.]

Cassava.

The cultivation of cassava for a food-stuff in times of dearth to be used by the peasantry of St. Elizabeth (Jamaica) has recently been occupying the attention of the Agricultural Society of Jamaica.

The preliminary investigations of the committee appointed by the Society, as reported in the Jamaica Daily Gleaner of January 14, 1897, show that at present no accurate statistics exist as to: 1) the cost of cultivation; 2) the yield per acre of cassava; 3) the quantity of starch from a given weight of tubers. The committee, however, consider the subject of sufficient importance to warrant further investigation and the institution of careful experiments in the growth of cassava under different conditions as to soil and climate, and in the manufacture of its products by the best methods.

Cassava is cultivated at a nominal cost, and is said to be one of the most productive plants in the world, an acre of cassava yielding more nutritive material than six acres of wheat. The cultivation entails but little labor and may be undertaken by women and children; for, except in the early stages of growth, the plant is almost independent of moisture and scarcely requires attention. Even under the present crude conditions a cassava patch yields an abundant harvest, and, if the plant were systematically grown by the settlers in those portions of the island subject to drought, it would greatly ameliorate their condition during periods of dearth.

The cultivation of cassava appears to have been long neglected in the island of Jamaica, and it is satisfactory to know that such a valuable economic product is likely to be more utilized in the future than in the past.

[Journ. Imp. Inst., 3, p. 155.]

The Poisonous Alkaloid of the Aconite of Nepaul.

At the instance of the Government of India, an investigation is being conducted, in the Scientific Department of the Imperial Institute, of the constituents of the various species and varieties of Aconite, with particular reference to those which are indigenous to India. All these plants have been medicinally employed, whilst some of them are highly poisonous.

The best known member of the group is Monkshood, or Wolf's Bane (*Aconitum Napellus*). This familiar garden plant is used medicinally both in Europe and in India, the chief supply for this purpose being at present derived from Germany. The principal constituent of the plant is the alkaloid aconitine, one of the most poisonous of all the vegetable alkaloids. Aconitine, its salts and derivatives, have been fully investigated by Professor Dunstan and his assistants, and the results have been described in a series of papers published in the Journal of the Chemical Society, to which has been recently added an account of the alkaloid (atisine) obtained from the non-poisonous *Aconitum heterophyllum* of India.

The Journal of the Chemical Society for March includes a paper by Professor Dunstan and Mr. F. H. Carr (the Salters' Company's Research Fellow in the Laboratories of the Imperial Institute), in which a full account is given of the poisonous alkaloid contained in the aconite of Nepaul, the "bish" or "bikh" of the Indian bazaars, which is for India the most important of all the aconites. The plant, usually described as *Aconitum ferox*, grows abundantly in the Himalayas. It has been extensively used in Indian medicine, and is known to be highly poisonous, its medicinal action being very similar to that of *Aconitum Napellus.*

The properties of the alkaloid called pseudaconitine may be briefly alluded to here. The alkaloid itself is crystalline and differs in composition from aconitine; the crystals, however, are very similar in form to those of this alkaloid, so much so that the two substances may perhaps prove to be isomorphous. The salts of pseudaconitine have been carefully examined; most of them crystallize well, and their properties are shown to differ from those of the salts of aconitine. When the alkaloid is heated until it melts, acetic acid is given off, leaving a new alkaloid which has been named pyropseudaconitine. This is a very bitter substance, but is not poisonous.

When heated with water, alkalis, or acids, pseudaconitine suffers hydrolysis. Acetic acid is first split off, leaving an alkaloid named veratrylpseudaconine, the properties of which have been fully described. Veratrylpseudaconine is bitter, but not poisonous. On further hydrolysis this alkaloid breaks up into dimethyl-protocatechuic or veratric acid, and an alkaloid pseudaconine, which is likewise non-poisonous.

From a preliminary study of the physiological action of pseudaconitine made by Dr. F. W. Tunnicliffe, of St. Bartholomew's Hospital, it appears to behave very like aconitine, but is probably rather more poisonous.

It has therefore been shown that whilst there is a very close similarity between the aconitine from *Aconitum Napellus* and the pseudaconitine from *Aconitum ferox*, they are physically and chemically distinct alkaloids, differing both in composition and structure. From the latter point of view, one important difference is the fact that in pseudaconitine the benzoic group of aconitine is replaced by a veratric group. The chemical work of isolating, examining and comparing the alkaloids of the different varieties of aconite is now in active progress in the laboratories of the Imperial Institute, and it is being followed up on the medical side by a determination of the physiological action of each alkaloid.

[Journ. Imp. Inst., 3, p. 153.]

The "Shinia" Leaves of Cyprus.

A dispatch has been recently received from the Chief Secretary of Cyprus enclosing translations of pamphlets by M. P. Gennadius, Director of Agriculture in that island, on the industry connected with the cultivation of the shinia and laurel shrubs. *Pistacia lentiscus* is a shrub that grows abundantly in most parts of Cyprus and is called in the island "shinia"; a variety of this shinia is the mastic shrub of Schio, the leaves only of which have a commercial value, serving as a tanning and painting material. From the wood of the shrub charcoal of good quality is made, and from its seed, which is eaten by goats and pigs, oil can be extracted, which is fit, not only for burning purposes, but, in case of necessity, for food as well. For some time shinia leaves were exported from Cyprus to England in small quantities by the Cyprus Company, but the principal market for shinia leaves is Palermo, in Sicily, to which port there is an annual exportation from Tunis of 10,000 tons; they are there used chiefly for the adulteration of sumach (*Rhus coriaria*), which is grown in large quantities in Sicily and is thence exported to England and France. A good quality of shinia leaves is also consumed at Lyons as a dyeing material for silk stuffs.

The crop is gathered during the months of April to September, the leafy branches of the shrub being cut off, laid in heaps on the ground and left there until dry. This takes place generally in four or five days, during which the heaps are left undisturbed, in order that as few leaves as possible should come in direct contact with the sun, which bleaches and overdries them and thus depreciates their value. After being dried the branches are beaten with a flail to detach the leaves, which are then packed in sacks for the market. Before the beating takes place the top branches which cover each heap are removed and thrown away, because the leaves of these, having been bleached and burned up by the sun, are not only useless, but also injurious when mixed with the rest of the produce. Shinia leaves should not be gathered after rain, as an inferior quality is then obtained.

Another shrub, the laurel of Apollo, *Laurus nobilis*, is a most useful plant, its wood, leaves and fruit being all available for various purposes. The wood, although not very strong, serves, nevertheless, for structural purposes and cabinet-making; it is also used for fuel. The fruit resembles small olives and when pressed yields a greenish oil as thick as butter, and exhaling a strong, pleasant odor. This oil, well known to commerce as "laurel oil," is used in pharmacy and in perfumery, and is a protective against insects. The leaves serve as seasoning for cooked or preserved meats and fish, for which purpose they are dried and sold or are exported to other countries where the tree itself will not flourish. A considerable exportation of laurel leaves from Greece and the East is annually made to Austria (through Trieste) and the United States of America (through New York). The leaves are also used for packing with choice kinds of raisins and figs, in order to impart to those fruits the fragrance of the laurel oil, as well as to protect them against injurious insects. In veterinary surgery laurel leaves are considered to be an excellent external remedy against various cattle parasites, a decoction thereof being used for washing the parts of the animals most attacked by flies and other parasites. The laurel shrub is propagated only through its seeds, which are sown as fresh as possible direct in the soil and not in pots or boxes, as is the case with the seeds of some other plants. It prospers in a rather temperate soil, such as that of the southern range of the mountains of Cyprus, and, where soil and climate are suitable, will begin to bear fruit four or five years after the seed has been sown.

[Journ. Imp. Inst., 3, p. 155.]

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Reviews.

Praktischer Leitfaden der Gewichtsanalyse. Von Dr. Paul Jannasch a. o. Professor der Chemie an der Universität Heidelberg. Ein Bd., pp. xii, 314, mit zahlreichen Abbildungen im Text. Verlag von Veit & Comp., Leipzig. 1897. M. 6.50.

This book is not an exhaustive treatise on gravimetric quantitative chemical analysis, neither is it a mere outline; it is to serve as a well tested mediator and guide. In addition to the most common and tried methods the author desired to bring together his own methods and experiences. It becomes evident from the first pages that the book is not only written from the standpoint of the analytical chemist, but primarily from that of the teacher.

Since in quantitative chemical analysis so much depends upon the technique, the author begins with substances that call for manipulations of the simplest kind. These he explains at great detail and even indicates where in his opinion the instructor should go through the manipulation for the student, so that there may be no misunderstanding about the minutest detail. He evidently is a firm believer that the necessary care and neatness in analytical work is not acquired by intuition, but by painstaking and thorough instruction.

From the simpler substances he passes to more complex ones, giving special attention, in the latter part of the book, to the analysis of silicates. Although at the beginning the author seems to touch upon even the minutest detail, he does not appear to be guilty of unnecessary repetition. In numerous instances he, however, refers to the originals in journals and chemical treatises, thus supplementing the information contained in the text.

The present volume, which even at first sight makes a very favorable impression, is to be followed by one on volumetric analysis, which will, no doubt, be anticipated with considerable interest by all who have an opportunity to see the first part. The bookwork also is exceedingly neat for a treatise of this kind. *E. K.*

Das Pflanzenreich. Ein Handbuch für den Selbstunterricht für alle Pflanzenfreunde. Bearbeitet von Professor Dr. K. Schumann, Kustos am Königl. Botanischen Museum zu Berlin und Privatdocent, und Dr. E. Gilg, Assistent am Königl. Botanischen Garten zu Berlin und Privatdocent. Ueber 500 Abbildungen im Text, 6 Tafeln in Farbendruck. Geheftet 6 M., gebunden 7.50 M. Verlag von J. Neumann, Neudamm. 1897.

In these days when the line between the once contrasted terms scientific and practical is rapidly being erased, when the generalizations reached by the scientist serve to indicate points capable of adaptation to the purposes of our every-day existence, it is hardly correct longer to regard the scientist as impractical and the practical man as other than an investigator of special cases in some branch of science. It, therefore, has come about that the significance of science is daily being more widely recognized and a knowledge of at least the rudiments of its several branches has come to be regarded as necessary. This increasing popular attention to the sciences has brought with it an increasing demand for works presenting the fundamentals in a clear, untechnical manner. Perhaps in this respect, Germany, "the schoolmistress of the world," leads in the number and high character of her popular scientific works. This line of public education is not left to the ill-trained or to the mercenary, but is undertaken by scientists of high rank.

If one may judge by a single volume, a series of popular works along the most prominent lines published by J. Neumann, now in part already in the hands of the public, belongs to this class. Volume VII of this series, called *Der Hausschatz des Wissens*, dealing with botany, is a substantial volume of about 850 pages, illustrated by a profusion of illustrations generally excellent. The authors, docents in the University of Berlin, are men of established reputation as botanists and their names are a guarantee for the quality of the work.

The plant kingdom here spread out before the reader is that seen by a systematic botanist. This is probably to be commended, since the relationships of plants in general appeal more strongly to the public than their structure or their mode of living. The book opens with a brief and very interestingly written introduction by Dr. Schumann on the history of botany. Dr. Gilg follows with a brief account of the salient features of the anatomy and physiology of plants. The main body of the work is occupied by a systematic account of the vegetable kingdom, in which Dr. Gilg treats of the Cryptogams and Dr. Schumann of the Phanerogams. The botanical system followed is that of Engler.

Although a popular treatise on botany, there is much of thoroughness in the book. The *Myxomycetes*, slime moulds, occupy over thirteen pages and are illustrated by six figures, all after those of Engler and Prantl's monumental *Pflanzenfamilien*, now nearing its completion. The Bacteria also receive a very satisfactory treatment. An historical sketch of the development of our present knowledge and theories concerning bacteria and their activities is followed by a discussion of the morphology, physiology and systematics of this group. Their relation to disease and their economic significance are treated in the light of the latest investigations. But a detailed discussion of the various excellences of the work is out of the question. The higher fungi, in addition to ample text and cuts, are illustrated by two colored plates, one each of the poisonous and of the edible species.

Dr. Schumann's treatment of the Phanerogams, while that of the systematist, lacks that dryness which is sometimes associated with works on plant classification. In addition to descriptions of the various groups and of especially important species, a wealth of information on the uses of plants, medicinal and otherwise, is included. Bits of historical and economic information relieve the mass of descriptive material. An abundance of good illustrations enhances greatly the usefulness of this section of the book. These are in large part drawn from medicinal plants and are not available in the usual text-books on materia medica. For its illustrations alone the book deserves a place in the pharmaceutical library.

In one point, in the writer's opinion, the usefulness of this book might have been materially enhanced. Had the names of the authors accompanied the botanical names cited, many opportunities for confusion might have been avoided. Presumably, the popular character of the work was in the authors' minds the ground of justification of the omission. Especially in a work intended for reference, as this avowedly is, no ordinary measures in the interest of clearness would seem superfluous.

This book deserves to instruct non-technical readers and will doubtless be welcome to many botanists. The ample index makes readily available the large amount of information contained, and in any library this would be a much used book. The writer knows of no work of similar scope and character in the English language.

Rodney H. True.

Einführung in das Studium der Alkaloide mit besonderer Berücksichtigung der vegetabilischen Alkaloide und der Ptomaïne. Von Dr. Icilio Guareschi. Mit Genehmigung des Verfassers in deutscher Bearbeitung herausgegeben von Dr. Hermann Kunz-Krause. Zweite Hälfte (Schluss des Werkes). P. Gaertner's Verlagsbuchhandlung, Berlin. 1897.

No doubt, most persons remember with what intense pleasure they spent an hour or two at a time in their mother's lumber chamber, located possibly in the attic of an old homestead. Though to other persons it had none of the advantages of the parlor or the library, yet to the boy of the house it had its peculiar charms, especially if it was rich in relics of a past generation. Somehow the stories in the coverless books and even in the stray old newspapers possessed more fascination than those which in elegant binding paraded on the shelves of the library below. They were veritable treasures compared with those exposed to the gaze of every guest or visitor.

Chemistry also has its lumber chambers and to the systematic chemist they are ofttimes very troublesome. Yet they also have their charms. The groups of the alkaloids, ptomaïnes, leucomaïnes and of other ines constitute such lumber chambers. Fortunately for science and for the student of chemistry these lumber chambers are constantly diminishing. As the constitution of alkaloid after alkaloid becomes known, is is taken out of the chemical lumber chambers and placed with other compounds with which it is structurally closely related. Once in its place, it seems to lose its individuality. It no longer stands out boldly as an individual, but has become a member of a series, a link in a chain, and is merely treated as such, however interesting a link it may be.

Whereas this is truly fortunate, many if not most chemical students like to spend some time at least in these lumber chambers—even if it is for the purpose of bringing partial order into chaos—and on the whole do not regret that new discoveries, especially in the vegetable and animal worlds, constantly add more material.

Although it was announced at the time of the appearance of the first half of this monograph, that groups four and five, dealing with the alkaloids proper and ptomaïnes, were only of a temporary nature; and that as soon as the constitution of these substances became known they would be classified with the numerous series of open chained and closed chained nitrogen derivatives of parts one and two respectively, the second half of the book is fully as interesting and valuable as the first part. Indeed, to most pharmacists, who have not made an extensive study of organic chemistry, the second part now before us will, no doubt, be even more interesting than the first.

The general character of the work was described on p. 39 of this journal. The second half takes up the bases with closed chains; the group comprised by the term alkaloids; and group five treating of ptomaïnes and leucomaïnes. There is also an appendix containing additions to the text. In some instances information from journals of the present year is recorded, thus bringing it fully up to date. The book closes with a detailed table of contents and last but not least, with a twenty page double column alphabetical index. This makes the book exceedingly valuable for reference.

The treatise is not exhaustive. This, however, is not intended as criticism, for the authors intend it to be an "introduction into the study of alkaloids," using this term in its broadest sense. As such it is exceedingly valuable and for most persons will also serve admirably as a reference work. The praise bestowed upon it at the time of the appearance of the first part it has fully merited. It should find a place in every well equipped pharmaceutical and chemical library.

E. K.

Gesammelte Schriften von Eilhard Mitscherlich. Lebensbild, Briefwechsel und Abhandlungen. Mit den Heliogravüren von Mitscherlich und Berzelius, und 85 Textabbildungen und 10 Steindrucktafeln. Herausgegeben von Dr. Alexander Mitscherlich, Prof. der Chemie an der Universität zu Freiburg. Verlag von E. S. Mittler & Sohn, Königl. Hofbuchhandlung in Berlin. 1896. $4.60.

Eilhard Mitscherlich, as stated on several occasions in the pages of this journal (vol. 12, p. 29, vol. 13, pp. 13 and 146), was one of the founders of modern chemistry and the *facile princeps* of chemistry in the glorious galaxy of the intellectual and scientific peers of the young university of Berlin during its first decades. He had first studied philology and oriental languages, subsequently medicine, and this study led him to physics and chemistry, and in 1819 as a private student into the laboratory of the foremost master of chemistry at his time, Jacob Berzelius in Stockholm. On his return to Berlin in 1822, Mitscherlich became on the proposition of his later friends Alexander von Humboldt and Jac. Berzelius the successor of Klaproth in the chair of chemistry at the university of Berlin, which he occupied until his death, August 28, 1863. His most important accomplishments are, as well known, the discovery of the laws of isomorphism and dimorphism, and of the relations between crystallization and chemical constitution, and the discovery and study of benzol and its derivatives, whereby he opened the path to the vast domain of hydrocarbons and the aromatic compounds leading to the discovery and the perfection of the so-called aniline colors.

As briefly described on p. 13, vol. 13 of the "Rundschau," a beautiful bronze statue of Mitscherlich was erected on the campus of the University of Berlin on Dec. 31, 1894, which in conjunction with similar monuments of his contemporaries, Berzelius in Stockholm, Wöhler in Göttingen, and Liebig in Giessen and München, proclaim to coming generations the memory of these chief founders of modern chemistry.

A not less enduring monument has recently been set to the memory of the great chemical philosopher by the collection and publication of his miscellaneous scientific papers, academic orations and part of his correspondence with Berzelius and other scientists, published by his son in the above named compilation.

Besides Mitscherlich's classical text-book of chemistry, first published in 1829 to 1835, this compilation contains a reproduction of his most important scientific papers scattered through various journals and academic publications, part of his correspondence with Berzelius and others. It also contains a brief biography of Mitscherlich and, at the conclusion, the oration of Prof. Ostwald of Leipzig at the dedication of the Mitscherlich statue at Berlin in December 1894.

This book, embracing 678 large octavo pages, is an important adjunct to the Prof. Ostwald's well-known series of "Klassiker der exacten Wissenschaften," published some years since by Wilhelm Engelmann in Leipzig (Rundschau, vol. 11, p. 149), as well as to the recently published correspondence between Liebig and Wöhlen and Liebig and Berzelius, and to the well known "Reminiscences of contemporary friends" by A. W. von Hofmann.

The book is of excellent make-up with two heliogravures of Mitscherlich in his youth and in advanced years, and of Berzelius at the time when Mitscherlich was his student. It forms a valuable addition to the literature of the history of chemistry as well as to every university or college and private library, and will certainty be a most tender reminder of the great and ingenious professor and examiner to those who have been among his students and are still living at home and abroad. *Fr. H.*

Meyer's Conversations-Lexicon. Ein Nachschlagebuch des allgemeinen Wissens. Fünfte gänzlich neubearbeitete Auflage. Mit ungefähr 10,000 Abbildungen im Texte und über 1000 Bildertafeln, Karten und Plänen. 14. Band, 1076 Seiten (Politik—Russisches Reich). — 15. Band, 1060 Seiten (Russ. Reich—Sirte). Bibliographisches Institut, Leipzig. 1897.

Man hat das Conversations-Lexicon vielfach als den Gradmesser der heutigen Kultur bezeichnet. Das ist richtig, soweit man von der Bearbeitung eines solchen Werkes voraussetzen darf, dass sie dem einzelnen Gegenstand unter Berücksichtigung der herrschenden Strömung gerecht wird, seine Bedeutung von der gesammten geistigen Bewegung auf jenem Gebiete ableitet und so ein Spiegelbild menschlicher Forschung und Thätigkeit schafft, das vollen Einblick gewährt in die Entstehung, Gestaltung und Ausbreitung jeder Wissensfrage bis auf die Gegenwart. Es muss zugestanden werden, dass das Meyer'sche Werk diesen Anforderungen vollkommen entspricht. Es unterrichtet über die älteren Forschungen mit derselben erschöpfenden Gründlichkeit, mit welcher es den Ereignissen der Gegenwart auf Schritt und Tritt folgt. Dies und die hervorragende Stellung dieses Lexicons in der encyclopädischen Literatur unserer Zeit bekunden die vorliegenden, wie alle zuvorgegangenen Bände. Dieselben umfassen der alphabetischen Reihenfolge nach auch auf wissenschaftlichen Gebieten ein reichhaltiges Material mit einer grossen Anzahl Farbendruck-Illustrationen, Karten und Plänen, die sich durch mustergültige Naturtreue und Schönheit auszeichnen.

Text wie Illustrationen und kartographisches Material bekunden durchweg die völlige Neubearbeitung des ganzen Werkes und stellen dasselbe in jeder Weise auf die Höhe unserer Zeit und der gesammten einschlägigen Literatur. *Fr. H.*

Des Acanthacées Médicinales. Thèse pour l'obtention du diplome de pharmacien de 1re classe, par Georges Dethan, Paris. Imprimerie F. Jourdan. 1896.

M. Dethan in a pamphlet of 192 pages, illustrated by 44 figures in the text, discusses the species of the order *Acanthaceæ* used in medicine. In the general part of the thesis, the history, geographic distribution and general morphology of the order are briefly treated. The types of structure, both normal and anomalous (*Thunbergia*, *Mendoncia* and *Acanthus*), the form and distribution of the cystoliths, so characteristic of this family, and the raphides are described. The various systematic dispositions of the members of the order, as made by Jussieu, Nees, Bentham and Hooker and Lindau, are cited and that of Bentham and Hooker adopted.

The second part deals with the individual genera and species. Habitat, synonomy, vernacular names, structural characteristics and uses are given. In a few cases, chemical information is included. The main emphasis seems to be laid on the anatomical studies. Many interesting details in this unusually interesting group of plants are developed. For these, the reader must seek the original. *Rodney H. True.*

Helfenberger Annalen 1896. Erster Band des zweiten Dezenniums. Im Auftrage der chemischen Fabrik in Helfenberg bei Dresden Eugen Dieterich herausgegeben von Dr. Karl Dieterich, Mitinhaber der Firma. Ein Bd., pp. 415. 1897. M. 3.00.

A considerable number of German factories publish annuals, semi-annuals or quarterlies, which are semi-commercial, semi-scientific in character. They frequently contain very valuable information along both lines and are of permanent value. The Helfenberger Annalen constitute such an annual. For ten years this annual has been edited by the founder of the firm, the well-known author of Dieterich's Manual. With the second decennium his son has assumed editorship. The first volume of this decennium, for the former pamphlet has grown into a formidable octavo volume of over four hundred pages, now lies before us. The first part contains the original contributions, which emenated from the research laboratory of this factory, most of which have already appeared in the German pharmaceutical journals. Several, however, are published for the first time. This part constitutes almost three-fourths of the volume. The second part consists of a compilation of methods of examination of crude drugs and preparations made from the former numbers of the Annalen since 1886 and brought up to date. Part three is entitled Electrotechnical Communications and constitutes a new feature of the Annalen. *E. K.*

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The Kaiser Wilhelm's University of Strassburg.

A brief historical sketch of its development and the celebration of its twenty-fifth anniversary.

By *Frederick B. Power*, Ph. D., F. C. S.

In the early days of May, and favored by bright skies and all the freshness and beauty of spring time, the Kaiser Wilhelm's University of Strassburg celebrated its silver jubilee. From near and from far large numbers of the former students of the university made pilgrimages to the shrine of their *alma mater*, in order to give expression to their homage and devotion and to renew once again cherished associations, while large delegations of student organizations from nearly all the universities throughout the empire united in bringing to their younger sister — the "Wilhelma Argentinensis" — their personal greetings and tributes of congratulation.

For those, however, who will discern the true significance of this celebration, it will not suffice to simply look back over the short space of a quarter of a century to the time when the new German University was organized, or to consider only its grand development in the intervening years, but a glance must also be cast upon those remote days when in the old free imperial city of Germany a stronghold of science was erected, which was to serve as the intellectual centre of Alsace, and which was destined to play so important a part in the struggle for freedom of thought and the promotion of mental culture.

It was, indeed, on May 1, 1667, or 230 years ago, that Strassburg was the scene of a celebration similar, although naturally on a scale incomparably smaller and less grand, in its character, to that of the present year, for it was designed to commemorate the one hundredth anniversary of the academy, to which the Emperor Maximilian II had, in the year 1566, granted its philosophical faculty the right to confer degrees, although it was first opened on May 1, 1567, and to which Ferdinand II, in 1621, gave the name and the rights of an university.

The history of the old Strassburg University shows that it was a product of the religious movement of the sixteenth century, and in that spirit of humanism, which was of so much importance to Alsace, it continued to develop and to exercise a beneficent activity until it fell a sacrifice to the oppression and the reaction produced by the French Revolution.

The actual and chief embodiment of the spirit from which the Strassburg University emanated, was the statesman Jacob Sturm, of Sturmeck, who was termed by Grasmus "the incomparable". At the beginning of the Reformation, educational institutions suffered many vicissitudes. Many of the convent schools were closed, and nothing was done to replace them by others. This subsequently gave rise, however, to the common or public school (Volksschule), which must be regarded as a true offspring of the Reformation, and it was due to Jacob Sturm that one of these was founded in Strassburg as early as 1525. In this school reading and writing were taught, and the New Testament and the Roman history of Livius were read in a German translation. As it is recorded "he wished to implant christianity and the Roman virtues in the hearts of the youth of the city." At the same time, besides providing for the elementary instruction of children, an improvement was effected in the Latin schools, of which three existed, where Greek, Latin and Music, as also Hebrew and Theology, were taught.

In about the year 1530, Jacob Sturm and Butzer also established a higher theological school, for the maintenance of which many cities of southern Germany contributed, and which constituted the beginning of the later university. It was first, however, in 1536 that these higher institutions of learning received systematic organization and were brought together as an organic entity and conducted under the able direction of Johannes Sturm, a man of broad culture, who was called from Paris for this purpose. The plan of instruction of this new school included Greek, Hebrew, Mathematics, and other subjects, and the professors also became connected with the Church of St. Thomas, by means of which they were able to essentially improve their material position. Foreign scholars of reputation who passed through Strassburg also delivered lectures, and the toleration and hospitality which that city tendered to those men of intellectual capacity who had either suffered persecution or had been banished from France, Italy and other countries was rewarded by service rendered to its schools. In 1538, the number of French fugitives was so great that a special religious service was held for them, and it was in fact no less a man than Calvin who first conducted this service, and who otherwise during the three years of his residence took a most active part in the scientific and religious life of the town.

In May 1538, the school formed from the combined Latin schools then existing was opened as a gymnasium, and its first rector was Johannes Sturm. Slowly but steadily its development continued in spite of all opposition, and without being influenced by the storms of religious dissensions, which were so disastrous to the reform movement, until in 1566 a bold step forward was taken and the gymnasium became expanded into an academy, or, as it was termed, an incomplete university with limited rights; for it still possessed no proper jurisdiction and had no professorship for canonical law. The intellectual life of the institution at this time was very active, for at the celebration of festivals of the academy stirring representations of Roman history were given on the *Forum romanum*, and on St. John's Day the dramatic poems of Plautus and Terence, of Sophocles, Euripides and Aristophanes were artistically presented in the beautiful theatre of the academy, which was also the first established theatre of Germany. These were much appreciated and enjoyed, not only by the scholars of the time and by professors and students, but also by the humbler citizens, for the latter, on account of the large amount of literature which was issued at Strassburg in the form of translations, had also become acquainted with the ancient classics and inspired with the free life of the old Greeks and Romans.

The further progress of the academy was for a time much impeded by a religious opposition to its free spirit, which caused the rector to be removed from office and delayed the project of converting the academy into a complete university. In the year 1594, King Rudolph II had indeed permitted the professors of medicine and of law to grant the lower degrees, but no use was made of this privilege on account of the exclusion of the theologians, who found no favor with the King. It was therefore first in 1621 that the city was granted a complete university, and on August 14 of that year the festivities of its inauguration began, which were continued for eight days with great pomp. The storms of war, which for three decades had devastated Germany, now again arose and obstructed the further development of its scientific life. On May 1, 1667, as already noted, the centennial jubilee of the university was celebrated, but Strassburg was compelled to share the fate of Alsace, and by the act of capitulation effected on September 30, 1681, the city was separated from the German Empire and placed under the protection of the King of France. This act, however, embodied the assurance that the King should permit the university to retain the character which it at that time possessed. It was thus recognized on the part of the French as a stronghold of German thought, German science, German customs, and the German language, although they were jealous of the freedom which its independent position gave it. Three branches, history, medicine and the science of government, attained a special development, and exercised a remarkable influence upon the culture of the entire century.

In the year 1738, there was established at Strassburg the first school of theoretical and practical gynaecology, in which were educated the most eminent gynaecologists of Germany, Switzerland, Holland and the North. The foundation of a maternity hospital, a botanical garden, and a cabinet of natural history also took place at this period, and in 1773 there already existed an astronomical observatory. The library, the beginnings of which dated from the time of the Reformation and from the donations of Jacob Sturm, was likewise increased, especially by the rich legacy of the celebrated historian Johann Schöpflin, of whom Goethe has expressed his admiration in the poem "Dichtung und Wahrheit." Teachers of modern languages were appointed, and in order to attract rich and prominent students, a riding school was established. Such was the reputation imparted to the university by Schöpflin and by the teacher of state rights — Wilhelm Koch — that in Germany and France, and even in Russia, those young men were preferably selected for offices of diplomacy and instruction who had been trained at Strassburg.

The more, however, the French element expanded in Alsace and in Strassburg, and, since the middle of the eighteenth century, the more the French language also began to replace the German, the greater were the efforts of the French Government to obtain influence over the university. But such an attempt was repulsed by a memorandum of the teaching staff, in which it was emphasized that the university was dependent only on the chief magistrate, and that "in consideration of its constitution, as also especially in view of its relations with the other celebrated universities of Germany, it must be regarded as a German and a protestant university." It was specified in the very cleverly constructed act of incorporation that it would be a great political mistake if the previously adopted methods of instruction, which had been so fruitful in results, should become gradually changed and arranged to suit the taste of a French university. Thus the management of the old German university in Alsace remained secure until the time of the French Revolution, notwithstanding the mighty political storms, which swept over the land.

From this period onward the names of the most celebrated scholars were associated with Strassburg university, and their fame was extended not only throughout Germany, but to adjacent countries. The sons of noblemen and many German princes were attracted thither, and many of these afterward became prominent as statesmen and diplomats in Germany and Austria. Thus in the years 1785—1787 among the young people of high rank in attendance at the university there were, besides 17 Germans, 16 Frenchmen, 23 Englishmen and Scotchmen, 11 Danes and Swedes, 5 from the electoral dominions and Poland, and 44 Russians. Most prominent of all these was Goethe, who was matriculated on April 18, 1770, and whose inscription as a student of the university reads as follows: Johannes Wolfgang Goethe Moeno-Francofurtensis, with the appended note "logiere bey H. Schlag, auf dem Fischmarkt." The house thus referred to, in which he lodged, still remains and is designated by a suitably inscribed tablet. In an old publication of 1744 there occur the words: "Strassburg liebt die Musen und wird von den Musen geliebt" (Strassburg loves the Muses and is loved by them), and thus we find that Goethe in the poem "Dichtung und Wahrheit" has also rendered an enduring tribute of praise to the old Strassburg university.

That which the French Government was not able to accomplish on account of the firm resistance of the university corporation, was, however, finally effected by the events connected with the revolution. In the year 1793, three of the professors were arrested, and many others soon experienced the same fate. The catholic academy had previously been destroyed, the city library was closed, and in accordance with a decree of August 15, 1797, the protestant university, after a glorious existence of one hundred and fifty years, was finally compelled to close, as was also the protestant gymnasium. As a result of these events it is recorded that in the scientific circles of Alsace, and especially of Strassburg, there prevailed at that time "the solitude of a cemetery," for only scantily equipped primary schools were available for instruction, and in these the French language was made compulsory. It was the avowed purpose to attack "the Hydra of German culture and customs," as the university that had been allowed to remain in the midst of the French organizations was regarded, and it was therefore decreed that this should and must be killed.

Amid this devastation only the school of medicine was allowed to remain, as this was needed by the army. Under the consulate, and as tranquility and some degree of stability began to return in public affairs, a School of Pharmacy was also established. By a decree of Napoleon I, dated March 17, 1808, these were united with the gradually created faculties of theology, mathematics and natural science, and belles-lettres to form a higher institution of learning, which was known as the Académie imperiale. The protestant academy, which had again been revived, was known from this time on as the protestant seminary. Of the former teachers in the university only a few were drawn to the new French academy, which existed until the war with Germany in 1870, but which naturally was never able to attain again the significance and the influence which the old German university had possessed.

No sooner had it become an established fact that Alsace-Lorraine had again been made a German province, than everywhere the desire was expressed that the old university of its chief city should be restored. This was responded to the more willingly by the government from the fact that the wish was also shared by the Alsatians. The first one to give official expression to this idea was the Deputy von Treitschke, at that time a Heidelberg professor. In his speech in the German parliament on May 20, 1871, on the occasion of the consideration of the bill relating to the union of Alsace-Lorraine with the German Empire, he said: "Above all else we wish to see the revival of the university on the frontier. The old province of the humanists — Alsace — should see again a flower of free science bloom in its chief city." A few days afterward a formal motion was made that the chancellor of the empire — Prince von Bismarck — should be commissioned to found a German university in Strassburg, and on December 11 of the same year Baron von Roggenbach, in Baden, was entrusted with the duty of its organization. This distinguished statesman gave expression to his purpose to create "a German university of the first rank, which should be a conservator of German science and a seat of culture worthy of the German spirit." As sufficient means stood at his disposal, the most eminent teachers were called to the new institution, and there were indeed many among those who filled the professonal chairs whose names were not only an ornament to the university, but to the sciences or departments of learning which they respectively represented. Many of these earlier teachers have since passed from the stage of human life and activity, but there are none whose memory will be more enduring or more reverently cherished by pharmaceutical students than that of the late lamented Professor Flückiger. That the natural sciences generally were well represented at the time of the re-organization of the university, is attested by such well known names as von Baeyer, afterwards succeeded by Fittig and Rose (Chemistry), Hoppe-Seyler (Physiological Chemistry), Schmiedeberg (Pharmacology), De Bary (Botany), Kundt (Physics), Groth (Mineralogy), etc., while the various other faculties were equally well equipped with talented teachers and investigators.

The buildings first occupied by the new university were those of the French academy, but others of great architectural beauty and much better adapted to the requirements of the various institutes were gradually constructed in the newer portion of the city, and these were dedicated in 1884. To those interested in the advancement of pharmaceutical science it is a matter of disappointment and regret that this department is the only one still unprovided with a new building, for it continues to occupy the very inadequate quarters of the old École de Pharmacie, where Pasteur taught nearly fifty years ago. The hope is entertained, however, that these requirements may also soon be appropriately met.

In the beginning of this brief historical sketch reference was made to the recent celebration of the twenty-fifth anniversary of the Kaiser Wilhelm's University, and it may be assumed that some account of the exercises and festivities connected therewith, which even extended over a period of four days, will not be devoid of interest. They were initiated on April 30, by a reception of the guests in the Civil Casino, and especially in the evening of the same day by a torchlight procession of the students. No better illustration could be given of the spirit which dominates the German Universities, and which has been aptly termed the *universitas universitatum*, than this grand spectacle presented. Although torchlight processions are not of such rare occurance as to be an altogether unfamiliar incident of German student life, and the older students of Strassburg will always retain a vivid recollection of a demonstration of this character in 1877, on the occasion of the dedication of the Strassburg University as the "Kaiser Wilhelm's Universität," when the venerable Emperor Wilhelm I, the lamented Crown Prince Friederich and Count von Moltke were its most honored guests, it may still be said that so imposing a scene of academic life had never before been witnessed in Strassburg, and perhaps in no other university town. Between 1600 and 1800 students, accompanied by many bands of music and mounted heralds, took part in this procession, which included delegations from the universities of Berlin, Bonn, Breslau, Erlangen, Freiburg, Giessen, Göttingen, Greifswald, Halle, Heidelberg, Leipzig, Jena, Marburg, Rostock, Tübingen, Würzburg, and from Basel and Zürich. This great body of students with their flaming torches, and the bright costumes of the various organizations with their banners and flags, were seen to the best advantage from the main building of the university, where a short halt was made in order that a deputation might be received by the rector. The brilliancy of the scene was further enhanced by powerful electric lights, which were directed upon the spire of the Cathedral and other prominent buildings. The line of march was subsequently taken up to the residence of the Governor of Alsace-Lorraine and through the principal streets of the town, which occupied 2½ hours, and the procession was finally brought to a close in the Cathedral square, where, during the singing of *Guadeamus igitur*, the burning torches were thrown together.

On May 1, the celebration found its chief and more serious expression in the so-called "Festact" or official ceremony, which took place in the Aula or grand central court of the main building of the university. In this palatial room, which was appropriately decorated, were assembled the present and former teachers and students of the university, prominent officials representing the empire, province, and municipality, the military and clergy, as also a committee of the deputies and other notables from the city and country at large, while on either side the auditorium was flanked by representatives of the various student corporations, arrayed in bright costumes and each bearing its standard of colors. The proceedings were opened by orchestral music, which included a specially composed overture, the national hymn, and an allegro in which selections from the best known student melodies were interspersed, after which the vast assemblage was greeted in the name of the academical senate by the rector of the university. The state secretary, as the representative of the Governor, who was absent from the city, then delivered a congratulatory address from the German Emperor, who had signalized the anniversary by conferring upon the rector an official chain of office to be worn on all festal occasions, and with which he was formally decorated. This quite massive chain, of most exquisite workmanship, is composed of gold medallions, each of which is in some respect emblematic, while the general character of the whole is designed to typify the time of the dedication of the old Strassburg University in 1567. Addresses were then delivered by the rector, prorector, the mayor of Strassburg and others, after which many beautiful gifts commemorative of the jubilee, such as paintings, literary works, etc., were presented to the university by the faculty and by former students and friends. The rendering of a cantata by the academic glee club brought to an official close these impressive and inspiring ceremonies.

Of the various social entertainments provided for the occasion there need only be specially mentioned an excursion into the Vosges mountains on the last day of the festival. A large company of professors, students and guests, between 600 and 700 in number, were conveyed by a special train to Türkheim, from which point a pleasant walk through the forest let to a summit known as the "Drei Aehren," where a view over the Rhine valley and extending even to the snow-crowned peaks of the Alps disclosed a panorama of rare beauty and grandeur. It was, however, not only the delights of the surrounding landscape, but more especially the opportunity afforded for the intimate association of teachers and students, and the commingling of friends who had been long and distantly separated, that imparted to the day its peculiar charm and crowned it with its pleasantest memories.

The earlier poets had sung in latin verse *laudem Argentorati*, but those former students of the Kaiser Wilhelm's University who, after an absence of many years, have not only had the pleasure of visiting historic Strassburg and participating in the celebration of its jubilee, but who have received new inspiration from a revival of old associations with friends and teachers, can perhaps give no more fitting expression to their sentiment than in the verse written by Scheffel on the occasion of the dedication of the new university:

> Stosst an! Neu Strassburg soll leben,
> Soll wachsen und kraftvoll gedeih'n,
> Als Strasse für geistfrisches Streben
> Als Burg der Weisheit am Rhein!

London, June 1897.

ORIGINAL CONTRIBUTIONS.

Medicinal Plants of Brazil.[*]

By *Dr. Theodor Peckolt of Rio de Janeiro.*

Oreodaphne crassiramea Meissn. Dieser Baum kommt in den Staaten Minas und Rio de Janeiro vor und heisst *Canella branca* — weisser Zimmt.

Die Blätter sind verkehrt eirund oder länglich stumpf. Die endständige traubige Rispe trägt weisse, wohlriechende Blüthen. Das Decoct der Blätter dient als Thee und zu Einspritzungen bei Leucorrhœa. Das weisse, leichte Holz ist wenig geschätzt, wird höchstens zu Plafondbrettern benutzt und ist sehr der Beschädigung durch Termiten ausgesetzt. Sp. Gew. 0.824.

Oreodaphne spectabilis Meissn. Dieser grosse Baum mit niederhängenden Aesten kommt in dem Staate Goyaz vor, wo derselbe *Canella preta* — schwarzer Zimmt, benannt wird; in Minas, wo er als *Canella mescla* — mehrfarbiger Zimmt; und in Rio de Janeiro, wo er als *Canella barauna* — brauner Zimmt, bekannt ist.

Oreodaphne crassiramea Meissn. is found in the states Minas and Rio de Janeiro and is called *Canella branca* — white cinnamon.

The leaves are obovate or bluntly lanceolate. The terminal racemose panicle bears white, fragrant flowers. The decoction of the leaves is used as a tea and as injection in leucorrhœa. The light, white wood is little valued, is at the most used only for boards of ceilings and is much attacked by termites. Sp. gr. 0.824.

Oreodaphne spectabilis Meissn. This large tree with pendulous branches occurs in the state Goyaz where it is called *Canella preta* — black cinnamon; in Minas where it is known as *Canella mescla* — variegated cinnamon; and in Rio de Janeiro where it is called *Canella barauna* — brown cinnamon.

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[*] Continued from p. 72. Translated for the Review by Dr. R. H. True, Asst. Prof. of Pharmacognosy at the University of Wisconsin.

Die Blätter sind gestreckt-länglich zugespitzt, glänzend, dunkelgrün. Die schirmtraubigen Rispen tragen kleine, gelbe, wohlriechende Blüthen. Die Beere ist länglich, 2 Ctm. lang, weich-spitzig, von gelber Farbe und nur bis ¼ von einer lockeren, gelbgrünen Achse umschlossen.

Die Rinde hat kein Aroma, wird jedoch als mildes Adstringens benutzt. Die Wurzelrinde ist von stark bitterem Geschmack und dient als Tonicum und gegen Diarrhœ. Das Holz ist dunkelbraun, sehr fest und dauerhaft gegen Witterungseinflüsse. Für Bauten wird es hoch bezahlt. Sp. Gew. 0.988.

Oreodaphne splendens Meissn. findet sich in den Staaten Amazonas und Pará und heisst *Itauba preta* — schwarzes Steinholz, und *Cedro cinzento* — graue Ceder.

Es ist ein kolossaler Baum von 25 Meter Höhe bei 2 Meter Durchmesser, dessen dunkelfarbiges Holz als vorzügliches Material zu Schiff- und Häuserbau dient.

Als Volksmittel dienen die adstringirend wirkende Rinde und bitter schmeckende Wurzelrinde wie bei den Vorhergehenden.

Itauba preta und *Cedro preta* heisst auch **Oreodaphne Hookeriana** Meissn. in demselben Staate. Das Holz dieses hohen Baumes hat einen schwarzen Splint wie Ebenholz und wird als Ersatz desselben benutzt.

Oreodaphne Martiana Nees, var. **latifolia** Meissn. Dieser kleine, vielästige Baum ist im Staate Alagoas als *Amansa besta* — Eselzähmer bekannt.

Die grossen Blätter sind oval oder länglich elliptisch. Die kurzbefilzte Rispe trägt gelbe, schwachriechende Blüthen. Die kugelrunde Beere hat 1 Ctm. Durchmesser.

Die frische Rinde, wenn gestossen, entwickelt einen unangenehmen, penetranten Geruch. Die Gauchos, welche die wilden Esel zähmen, behaupten, dass wenn in einem Säckchen die frisch gestossene Rinde dem wilden Thiere vorgebunden wird, dasselbe sogleich beruhigt wird und in kurzer Zeit gezähmt werden kann. Das weisse, leichte, geruchlose Holz dient nur zur Anfertigung verschiedener häuslicher Geräthschaften.

Ein Bauholz, welches nicht der Witterung ausgesetzt werden darf, liefert der in Goyaz, S. Paulo und Minas vorkommende *Canella de Serra* — Gebirgszimmt,

Oreodaphne velutina Nees.

Oreodaphne acutifolia Nees kommt nur in den Südstaaten S. Paulo (südlich), Paranà, Santa Catharina und Rio Grande do Sul vor und heisst *Lauro branco* — weisser Lorbeer, *Lauro de Parana* und *Canella burra.*

Dies ist ein sehr hoher, starkstämmiger Baum und wird vorzugsweise zu Möbeln benutzt. Als Bauholz darf es nicht der Feuchtigkeit ausgesetzt werden. Die Bastrinde hat starkbitteren Geschmack und ist ein vielfach benutztes Magenmittel des Volkes. Dieselbe dient auch zur Bereitung eines bitteren Schnapses.

Oreodaphne bofo Neess. Dieser Baum wird im Staate Amazonas gefunden und ist als *Paó de guiabo* und als *Canella gosmenta* — schleimiger Zimmt — bekannt. Er erreicht eine Höhe von 12 bis 16 Metern. Die grossen Blätter sind länglich, etwas zugespitzt. Der Blüthenstand besteht aus traubigen Rispen von 13 Cm. Höhe mit weissen flaumartigen Blüthen.

Die Bastrinde ist ungemein reich an Schleim. Mit Wasser macerirt bildet dieselbe einen dicken Schleim, wie die Früchte von *Hibiscus esculentus*,

The leaves are narrowly oblong, acuminate, shining, dark green. The umbellate-racemose panicles bear small, fragrant yellow flowers. The berry is oblong, 2 cm. long, weakly pointed, in color yellow and enclosed only about one-fourth by a loose, yellowish-green axis.

The bark has no aroma, is used, however, as a mild astringent. The root bark has a strongly bitter taste and serves as a tonic, also as a remedy for diarrhœa. The wood is dark brown, very firm and durable under the influence of the weather. It is highly valued for buildings. Sp. gr. 0.988.

Oreodaphne splendens Meissn. is found in the states Amazonas and Pará and is called *Itauba preta* — black stonewood, and *Cedro cinzento* — gray cedar.

It is a large tree of a height of 25 meters and a diameter of 2 meters. Its dark colored wood is an excellent material for the construction of ships and of houses.

The astringent bark and the bitter-tasting root bark provide popular remedies as in the foregoing.

Oreodaphne Hookeriana Meissn. is also called *Itauba preta* and *Cedro preto* in the same states. The wood of this tall tree has a black sap wood, like the ebony, and is used as a substitute for the same.

Oreodophne Martiana Nees. var. **latifolia** Meissn. This small, much branching tree is called in the state Alagoas *Amansa besta* — ass-tamer.

The large leaves are oval or oblong-elliptical. The shortly pubescent panicle bears yellow, faintly fragrant flowers. The spherical berry is a centimeter in diameter.

The fresh bark, when crushed, develops an unpleasant, penetrating odor. The gauchos who tame the wild asses assert that if in a small sack the freshly crushed bark is tied in front of the wild animal, it becomes immediately quiet and in a short time can be tamed. The white, light, odorless wood is used solely for making various domestic implements.

Oreodaphne velutina Nees. furnishes a building-wood, which should not be exposed to the action of the weather. It occurs in Goyaz, S. Paulo and Minas and is called *Canella da Serra* — mountain cinnamon.

Oreodaphne acutifolia Nees. occurs in the southern states S. Paulo (southern part), Paranà, Santa Catharina and Rio Grande do Sul, and is called *Lauro branco* — white laurel; *Lauro de Parana* and *Canella burra.*

It is a very tall, strong stemmed tree and is used mainly for furniture. As a building-wood it must not be exposed to moisture. The inner bark has a strongly bitter taste and is a stomach remedy much used among the people. It is also much used in the preparation of a bitter whisky.

Oreodaphne bofo Nees. This tree occurs in the state Amazonas and is known as *Paó de guiabo* and *Canella gosmenta* — mucilaginous cinnamon. It attains a height of from 12 to 16 meters. The large leaves are oblong, somewhat acuminate. The inflorescence consists of racemose panicles 13 cm. in height, with white, cottony flowers.

The bast of the bark is unusually rich in mucilage. When macerated with water, it forms a thick mucilage like the fruits of *Hibiscus escu-*

deshalb die Benennung. Das Decoct dient als Umschlag bei entzündeten Wunden. Die Indianer benutzen die Rinde als Antidot bei Schlangenbiss: die Rinde wird gekaut, und ebenfalls ein gekauter Brei auf die Bisswunde gelegt und in kurzen Zwischenräumen erneuert.

Das weissgraue, poröse Holz wird zu Pfafondbrettern benutzt.

Nectandra canescens Nees. In den Staaten S. Paulo, Minas, Rio de Janeiro bis zum Aequatorstaate Amazonas. In den drei erstbenannten Staaten heisst dieser Baum *Lauro sylvestre* — wilder Lorbeer —, in den Nordstaaten *Muscataia* und *Muscutaia*.

Der schlanke Baum erreicht eine Höhe von 15 Metern. Die jungen, weichen Blätter sind gelblich befilzt; nach vollständiger Entwickelung sind sie starr lederartig, gestreckt, länglich und lancettlich, schmal zugespitzt, oberseits glatt, unterseits rostfarben oder gelblich filzig. Die 10 Cm. hohe Rispe besteht aus weissen, befilzten, wohlriechenden Blüthen. Die Beere ist eiförmig, 13 mmtr. lang, bis zur Mitte von der becherförmigen Achse umhüllt; reif im April.

Die Rinde hat einen angenehmen, sassafras- und zimmtähnlichen Geruch und dient als Volksmittel bei Diarrhœ, Magenaffectionen etc.

Nectandra Schottii Meissn. In den Staaten Minas, Espirito Santo und Rio de Janeiro. In ersterem heisst derselbe *Lauro de Matto Virgem* — Urwald Lorbeer —; im zweiten *Catinga de negro* — Negergeruch —; hier *fructo de caxingle* — Eichhörnchenfrucht; der richtige Tupiname ist *cachingélé*.

Es ist ein kleiner schlanker Baum mit glatter Rinde. Die Blätter sind lederartig, langgestreckt-länglich, zugespitzt, oberseits glatt, unterseits befilzt. Die Blüthenrispe ist kurz, gedrängt blüthig. Die Blüthen sind rostfarben befilzt, von starkem Bocksgeruch. Die Beere ist klein, länglich, von rother Farbe, der dritte Theil vom Becher umgeben, reif im Februar. Dieselbe ist ein Lieblingsfressen der hiesigen Eichhörnchen, *Sciurus æstuarus* L.

Die Früchte sind stark aromatisch, etwas pichurimähnlich. Dieselben werden bei Kolik genommen und zwar gestossen als Magenpflaster. Die Tinctur ist officinell und wird in Dosen von 8 bis 10 Tropfen verabreicht und findet auch als Einreibung bei Rheumatismus Anwendung. Die lorbeerartig riechenden Blätter dienen als Ersatz der Lorbeerblätter.

Nectandra mollis Nees var. **villosa** Meissn. Dieser schöne Baum kommt in dem Gebiete von den Staaten Rio de Janeiro und Minas nördlich bis zum Amazonas-Staate vor und heisst *Canella massapé*, *Canella inbaiba*, *Embuia*, *Inhaiba*, *Lauro preto*. Die häufigste Benennung ist *Canella preto* — schwarzer Zimmt. Derselbe erreicht eine Höhe von 18 Metern und einen Durchmesser von 1½ Metern. Der Blüthenstand besteht aus achselständigen und endständigen Rispen mit befilzten, heliotropähnlich riechenden Blüthen. Die Beere ist oval, gelb und bis zur Hälfte vom Becher umschlossen.

Die schwach aromatisch riechenden Blätter besitzen einen mild bitter-styptischen Geschmack. Der von denselben bereitete Thee dient als diureticum; eine Infusion von 30 Grm. zu 240 Grm. Colatur, Morgens und Abends genommen, bei menstrua suppressa; der mit Zuckerbranntwein bereitete Schnaps als Magenmittel.

Das Holz ist gelbbraun, nach längerer Zeit sich schwärzend, deshalb die Benennung. Es ist sehr

lentus, hence the above name. The decoction is used as a dressing for inflamed wounds. The Indians use the bark as an antidote for snakebite. The bark is chewed, and also the pasty mass obtained by chewing is bound to the wound. This is renewed at frequent intervals.

The grayish-white, porous wood is likewise used for boards for ceilings.

Nectandra canescens Nees. In the states S. Paulo, Minas, Rio de Janeiro to the equatorial state Amazonas. In the first three states named this tree is called *Lauro sylvestre* — wild laurel —, in the northern states *Muscataia* and *Muscutaia*.

The slender tree reaches a height of 15 meters. The young, soft leaves are yellowish-tomentose; when fully developed they are stiffly leathery, elongated oblong and lanceolate, narrowly acuminate, the upper surface smooth, under surface rusty or yellowish-tomentose. The panicle, 10 cm. tall, consists of white, tomentose, fragrant flowers. The berry is ovate, 13 mmtr. long, surrounded by the beaker-shaped axis to the middle; ripe in April.

The bark has an agreeable, sassafras- and cinnamon-like odor and is a popular remedy for diarrhœa, stomach troubles, etc.

Nectandra Schottii Meissn. In the states Minas, Espirito Santo and Rio de Janeiro. In the first, it is called *Lauro de Matto Virgem* — laurel of the primitive forest —; in the second *Catinga de negro* — negro odor —; here *fructo de caxingle* — squirrel fruit; the genuine Tupi name is *cachingélé*.

It is a small, slender tree with smooth bark. The leaves are leathery, elongated, oblong, acuminate, upper surface smooth, under side pubescent. The floral panicle is short, flowers crowded. The flowers are rust-colored, tomentose, of strong buck-odor. The berry is small, oblong, red, one-third enclosed in cupule, ripe in February. It is a favorite food of the Brazilian squirrels, *Sciurus æstuarus* L.

The fruits are strongly aromatic, somewhat like pichurim. They are given in colic and crushed as plaster for the abdomen. The tincture is official and is administered in doses of 8 to 10 drops and is also rubbed on externally in rheumatism. The leaves have a laurel-like odor and are used as a substitute for laurel leaves.

Nectandra mollis Nees var. **villosa** Meissn. This beautiful tree occurs in the region of the states Rio de Janeiro and Minas and northward to the state Amazonas, and is called *Canella massapé*, *Canella inbaiba*, *Embuia*, *Inhaiba*, *Lauro preto*. The commonest name is *Canella preto* — black cinnamon. It reaches a height of 18 meters and a diameter of 1½ meters. The inflorescence consists of axillary and terminal panicles of tomentose flowers, having an odor similar to that of heliotrope. The berry is oval, yellow and surrounded by the cupule to the middle.

The weakly aromatic leaves have a mild bitter-styptic taste. The tea prepared from them serves as a diuretic; an infusion of 30 grm. to 240 grm. of colature, taken at morning and evening, in menstrua suppressa; the liquor prepared with sugar brandy is used as a stomach remedy.

The wood is yellowish-brown, after a time becoming black, hence the name. It is very durdauerhaft und fest und von allen mit *Canella* benannten Laurineen am meisten geschätzt. Es dient zu Bauten, besonders zu Fussbodenbrettern in den aristokratischen Wohnhäusern. Die davon bereiteten Möbel werden ebenso hoch bezahlt als Mahagoni und es gehört zur Eleganz einer Wohnung, dass die Möbel eines Esszimmers von diesem Holze angefertigt werden.

Nectandra leucantha Nees. Dieser Baum kommt in den Staaten Bahia, Espirito Santo, Minas, S. Paulo und Rio de Janero vor, und ist als *Canella secca* — trockener Zimmt —, *Canella mirim* — kleiner Zimmt —, *Carvalho secco* — trockene Eiche — bekannt.

Derselbe ist dünnstämmig, bis 10 Meter hoch, mit länglich-ovalen und lancettlichen Blättern. Die kurzen Blüthenrispen haben weisse, wohlriechende Blüthen mit gelbbefilztem Kelch. Die Beere ist hellgrün, länglich-oval, 27 Mmtr. hoch, zum dritten Theil vom Becher umgeben, welcher, wie auch der Fruchtstiel, carmoisinroth gefärbt ist.

Das Holz findet nur zur Anfertigung von Möbeln Verwendung. Die stark bitter schmeckende Wurzelrinde dient als magenstärkendes Mittel; ein Decoct von 20 Grm. zu 180 Grm. Colatur bei Diarrhœ. Die schwach aromatischen Früchte dienen gepulvert als Volksmittel bei Leucorrhöe. Dreimal täglich wird ein Theelöffelvoll genommen und als Einspritzung dient ein Absud der Blätter.

Gleiche Benutzung findet die var. **attenuata** Meissn., mit dem Volksnamen *Carvalho de capœira* — Gebüscheiche.

Nectandra Turbacensis Nees. Dieser hohe Baum kommt in den Staaten Pará and Amazonas vor und ist unter dem Volksnamen *Cigua* bekannt. Derselbe liefert ein vorzügliches Holz zu Schiffsbauten. Die runden Beeren haben Geruch und Geschmack wie Pichurim und werden vom Volke zu gleichen Zwecken benutzt.

Nectandra Rodici Rob. Schomb. Dieser Baum kommt in den Staaten Pará und Amazonas vor, doch ist sein hauptsächliches Gebiet Goyana. Die Brasilianer benennen den Baum *Canella limão* — Citronenzimmt, *Canella bibirú* und *Còração verde* — grünes Herz; die Indianer *Sipiri*.

Die Beschreibung dieses kolossalen Baumes, sowie die Benutzung und Darstellung des im Jahre 1832 aus der Rinde von Dr. Rodie entdeckten Bebeerins findet sich in allen Werken ausführlich. Hier wird das Bebeerin von den Aerzten nie benutzt. Das sp. Gew. des vorzüglichen Holzes ist 1.600.

Nectandra Puchury maior Nees. Dieser Urwaldbaum kommt in dem Staate Amazonas an den Flüssen Rio Negro und Yúpurú, seltener an den Ufern des Amazonenstromes vor. Am Yúpurú heisst derselbe *Himilão*. Die Tupi nennen ihn *Puchury*, die Brasilianer *Pichurim* und *Fava Pichurim*.

Derselbe ist in allen wissenschaftlichen Werken hinreichend beschrieben und ist nur zu bedauern, dass dieses nützliche Gewächs mit der Zeit vollständig vernichtet wird, ohne dass auch nur ein Bewohner der Aequatorialzone daran dächte, denselben zu cultiviren. Es wäre selbst Pflicht der Regierung, diesen nutzbringenden Kulturzweig zu bewerkstelligen oder wenigstens zu unterstützen. Die Lauraceen entwickeln sich schneller als die Myrtaceen, Myristicaceen und Rubiaceen, so dass man in acht Jahren schon Früchte ernten könnte.

Die Indianer sammelten die reifen Früchte, welche einige Tage in kleine Haufen gelegt wurden, damit die fleischigen Fruchtschalen sich leichter lösten. Die Cotyledonen wurden mit trockenem

able and firm and is prized more than that of any of the *Lauraceæ* designated as *Canella*. It is used in buildings, especially as boards for floors in aristocratic residences. The furniture prepared from it is as expensive as even that of mahogany, and elegance in a residence demands that the furniture of the dining room be made of this wood.

Nectandra leucantha Nees. This tree is found in the states Bahia, Espirito Santo, Minas, S. Paulo and Rio de Janeiro and is known as *Canella secca* — dry cinnamon —, *Canella mirim* — small cinnamon —, *Carvalho secco* — dry oak.

It has a slender trunk, attains a height of 10 meters and bears oblong-oval and lanceolate leaves. The short floral panicles have white, fragrant flowers with yellow, tomentose calyx. The berry is bright green, oblong-oval, 27 mmtr. in length, one-third surrounded by the cupule which together with the fruit pedicel is crimson-red.

The wood is used only for making furniture. The very bitter rootbark is used to strengthen the stomach; a decoction of 20 grm. to 180 grm. of colature finds use in diarrhœa. The weakly aromatic fruits when pulverized furnish a popular remedy for leucorrhœa. A teaspoonful is given three times a day and a decoction of the leaves is used as an injection.

The var. **attenuata** Meissn. finds the same use and is known popularly as *Carvalho de capœira* — thicket oak.

Nectandra Turbacensis Nees. This tall tree occurs in the states Pará and Amazonas and is known by the popular name *Cigua*. It supplies an excellent timber for ship building. The round berries have odor and taste like pichurim and is used by the people for similar purposes.

Nectandra Rodici Rob. Schomb. This tree is found in the states Pará and Amazonas, but it occurs chiefly in Goyana. The Brazilians call the tree *Canella limão* — lemon cinnamon, *Canella bibirú* and *Còração verde* — green heart; the Indians, *Sipiri*.

The detailed description of this large tree as well as the use and preparation from the bark of the principle bebeerin, discovered in 1832 by Dr. Rodie, is to be found in all works. Here, bebeerin is never used by the physicians. The sp. gr. of the excellent wood is 1.600.

Nectandra Puchury maior Nees. This member of the primitive forest occurs in the state Amazonas on the Rio Negro and Yúpurú Rivers, more rarely on the shores of the Amazon. On the Yúpurú, it is called *Himilão*. The Tupi call it *Puchury*, the Brazilians *Pichurim* and *Fava Pichurim*.

It is sufficiently described in all scientific works and it is to be regretted that this useful plant is being completely destroyed without a thought on the part of the inhabitants of the equatorial zone of cultivating it. It should be the duty of the government itself to inaugurate or at least support this profitable branch of industry. The *Lauraceæ* develop more rapidly than the *Myrtaceæ*, *Myristicaceæ* and *Rubiaceæ*, it being possible to secure fruit in as soon as eight years.

The Indians gathered the ripe fruit, which was laid for some days in small heaps in order that the fleshy fruit envelope should become more readily loosened. The cotyledons were rubbed off with

Grase abgerieben und auf Taquararohrhürden über gelindem Feuer getrocknet. Wenn die Sammler von Caoutschouc und Sassaparillawurzel im Urwalde diesen Baum fanden, statt die praktische Methode der Indianer zu befolgen, wurde der Baum umgehauen, um die Früchte zu sammeln, die zukünftigen Ernten zerstörend.

Im Jahre 1830 exportirte die Provinz Amazonas 1200 Arroben (1 Arroba = 15 Kilo), wofür per Arroba 16 Milreis bezahlt wurde. Im Jahre 1853 wurden nur 18 Arrobas exportirt, in 1855, 293 Arrobas; 1859, 61 Arrobas; 1860, 57 Arrobas, wofür in Pará per Arroba nur 7 Milreis erlangt wurden. Dieser Spottpreis entmuthigte wahrscheinlich die Sammler, denn von 1861 an kamen jährlich nur wenige Arrobas zum Export und jetzt gar nicht mehr. Im Jahre 1885 kaufte ich hier noch das Kilo zu 2 Milreis, dann stieg der Preis jährlich. Jetzt existirt nur noch ein sehr geringes Quantum am Platze und die Brasilianer verlangen 14 bis 20 Milreis per Kilo.

Rinde und Blätter besitzen ebenfalls stark aromatischen Geruch. Das Volk benutzt den Thee als excitans. Grossen Ruf haben die Bäder des Rindendecoctes bei Rheumatismus.

dry grass and dried over a gentle fire on Taquara reed wickers. When the collectors of caoutchouc and sarsaparilla roots in the virgin forests found this tree, instead of following the practical method of the Indians, they felled the tree in order to gather the fruits, thus cutting off future harvests.

In the year 1830, the province Amazonas exported 1200 arrobas (1 arroba = 15 kilos), receiving 16 milreis per arroba. In the year 1853, only 18 arrobas were exported; in 1855, 293 arrobas; 1859, 61 arrobas; 1860, 57 arrobas, for which but 7 milreis per arroba was received in Pará. This ridiculously low price probably discouraged the collectors, since from 1861 on, but few arrobas were exported yearly and now none at all. In the year 1885, I purchased here at 2 milreis per kilo. Since that date the price has risen yearly. Now but a small quantity exists and the Brazilians demand 14 to 20 milreis per kilo.

The bark and leaves have likewise a strongly aromatic odor. The people use the tea as a stimulant. Baths of the decoction of the bark enjoy a great reputation for rheumatism.

The Estimation of Menthol in Oil of Peppermint.

By Dr. *Clemens Kleber*.

In the American Journal of Pharmacy, vol. 69, p. 192, Mr. L. F. Kebler describes a modification of the method for estimating menthol in oil of peppermint as it had been suggested by Dr. F. Power and myself in 1894. This modification consists in acetylizing a weighed quantity of the oil and subsequent saponification of the product after washing and neutralizing it quantitatively, while we acetylize an arbitrary quantity and saponify an exactly weighed portion of the acetylized oil, after washing, drying and filtering the same. I have no doubt, that, if conducted with proper care, Kebler's method will yield exact results, but I want to mention, that when working out our method of estimation, we also took the method now proposed by Kebler into consideration, but found it less practical than the way described in our paper. Kebler says that according to his method the percentage of menthol can readily be estimated in three hours, while the original method requires the greater part of a day for execution. Against this I must state that in hundreds of estimations of menthol in oil peppermint, which we have performed since 1894, it never took us more than about 20—30 minutes to wash, neutralize and filter the acetylized oil since it is unnecessary to wait till the aqueous and oily layers are perfectly separated and since a small loss of oil is quite irrelevant, so that the whole washing and drying of the oil can be done while holding the separator in the hand, while in Kebler's modification any loss of oil must be carefully avoided, so that one has to wait until the aqueous solutions have become perfectly clear, which naturally requires much more time. Besides this, it must not be forgotten that peppermint oil is not quite insoluble in water, especially in that containing acetic acid as it results from the first washing, therefore small losses in Kebler's method are unavoidable.

A quick approximate estimation of menthol in peppermint oil can be made in the following way: About 5 gr. of peppermint oil (accurately weighed) are mixed, in a flask connected with a glass-ground condenser tube, with about 5 cc. acetic anhydride, accurately measured[*] and boiled for 30 minutes. In the meantime an equal quantity of the same acetic anhydride is titrated with normal caustic soda and phenolphtalein. After cooling the boiled liquid somewhat, the condenser is taken off and washed with some water, which is added to the acetylized mixture, and then the latter is titrated with normal caustic soda. The difference in the number of ccs. in both titrations multiplied by 0.156 gives the menthol in the oil used. An inconvenience of this method is that comparatively large quantities of normal solutions are required and that the desired number has to be calculated from the difference of both, which naturally makes the method less exact, but all of the operations can easily be performed in 50 minutes.

Laboratories of Fritzsche Brothers,
Garfield, N. J.

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[*] For measuring exactly equal quantities of liquids we recommend the following way: Hold a common pipette, preferably one with a somewhat long narrow mouth, which has been filled exactly to the mark with the liquid to be measured, perpendicularly over the receiving flask and let it flow out. The liquid flows out in a stream which stops suddenly, it will then last a number of seconds until drops beginn to fall off from the mouth. If the pipette is put aside as soon as the continuous stream stops and before the drops appear, the quantities of liquid thus obtained will be alike with very great accuracy, but they are of course smaller than the quantity for which the pippete is gauged. In cases where only approximate, but in every case perfectly equal, quantities are desired, we have found this method of great value.

Cinnamic Acid from Styrax and Benzoic Acid from Benzoin.

By *Edo Claassen.*

Styrax is boiled for some time with an excess of a sodium carbonate solution in a copper or other suitable vessel and to the mixture when cold and without having been filtered, commercial hydrochloric acid is added in such a quantity as to show finally a faint but distinct alcaline reaction. The contents of the vessel are then heated again to the boiling point, filtered, when cold, and the residue on the filter washed with water. To the filtrate, concentrated by evaporation, if necessary, is now added a sufficient amount of hydrochloric acid, the precipitate collected on a filter and washed with a small quantity of cold water, after which operations it is dried and extracted with hot rectified benzin. This solution has, after cooling, deposited a considerable amount of cinnamic acid. The benzin is now poured off on the crude acid and the work of extracting repeated as long as it yields acid. In the benzin separated from the last crystallization there is yet left some acid, wherefore it may be shaken repeatedly with a diluted sodium carbonate solution. Hydrochloric acid precipitates from the latter the acid, which is then brought on a filter, washed with cold water and dried. The cinnamic acid obtained at first is very white; later on, the same, particularly that separated from the last sodium carbonate solution, may often be found to be yellowish, in which case it should be treated with benzin as above.

It is evident that the same process can be used to extract cinnamic acid from certain kinds of benzoin resin and benzoic acid from the common commercial benzoin as also the mixed acids from balsam of tolu.

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Some Cuban Medical Plants.*

By *Robert Combs*, Asst. Prof. of Botany, Iowa State College, Ames, Iowa.

Urticaceae.

Cecropia peltata L. No. 111. "Yagruma hembra," Trumpet tree. Tropical America. The leaves of this tree have pectoral properties and are used in asthma. A proprietary preparation of Havana, having for its basis fluid extract of "Yagruma hembra," is called *Pectoral Antiasmatico* (Antiasthmic pectoral). Dr. Vildosola[5] reports an alkaloid obtained from the leaves of *Cecropia*, which he calls "cowleyina" in honor of Dr. Cowley of Havana.

The milky juice of many species of *Ficus* is used either as a nutritive, to prepare caoutchouc or to make "bird lime."

Some *Ficus* species have a poisonous juice.

Amaryllideae.

Curculigo scorzoneræfolia Benth. No. 42. "Azafran cimarrón," Wild saffron. This little plant is an emmenagogue and is considered capable of producing abortion.

Palmae.

Cocos nucifera L. No. 615. "Coco," Coca nut. Original to tropical America, but naturalized throughout the tropics. The tree furnishes timber and fibre, besides the valuable and extensively exported coca nut. The saccharine liquid from the interior of the green nut, forming the milk of the ripe nut, is used as a refreshing drink. A wine is also made from it. An oil is expressed from the albumen of the ripe nut, which has been said to possess tænifuge properties (Dr. Martiales, Havana), but I believe this has not been verified.

The production and exportation of coca nuts forms an extensive industry in Cuba.

MONTHLY REVIEW.

Chemistry.

A New Acid from Cochenеal.

Liebermann and Voswinckel have isolated from carmine an acid, cochenealic acid, to which the possible formula $C_{10}H_8O_7$ has been assigned with some reserve. With bromine water the crystalline tribrom derivative of kresotinic acid, $C_6H_3(CH_3)(OH)(CO_2H)$ is obtained. This is analogous to the nitrococcic acid obtained by the action of nitric acid on cochineal and recognized by Liebermann and van Dorp (Ber. 18, p. 3180) as trinitrokresotinic acid. [Ber. 30, p. 688.]

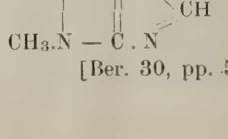
Thujone.

This ketone derived its name from the genus name *Thuja*, from an oil of which it was first obtained. Wallach found it besides fenchone in fennel oil and Semmler isolated it from tansy oil, hence the synonym tanacetone (from *Tanacetum*). Wallach, several months ago made a further report on the derivatives of this compound: Ueber die Verbindungen der Thujonreihe; and Tiemann and Semmler report: Ueber den Abbau von Tanacetketonsäure.

[Ber. 30, pp. 423 and 429.]

On the Constitution of Caffeïne and Related Compounds.

Emil Fischer has recently supplemented his preliminary notice made last year at the Frankfurt meeting of German Scientists and Physicians with regard to the constitution of caffeïne. The development of the caffeïne formula is traced and its relationship to other compounds pointed out. The experimental proof for the theoretical discussions of the first paper he intends to bring in a series of papers. For caffeïne he now adopts the formula suggested by Midicus more than twenty years ago, viz.



$$\begin{array}{lll} CH_3.N - & CO & \\ \quad | & \;| & \\ \quad CO & C\,.\,N\,.\,CH_3 & \\ \quad | & \;\| & \searrow CH \\ \quad | & \;\| & \nearrow \\ CH_3.N - & C\,.\,N & \end{array}$$

[Ber. 30, pp. 549 and 559.]

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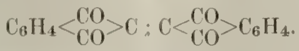
* Continued from p. 112.

[5] "Revista de Ciencias Medicas," Havana.

Indenigo.

Theoretical considerations about the color of organic substances induced V. Kaufmann to prepare an analogue of indigo in which the imido groups have been replaced by carbonyl groups. He succeeded in preparing several more or less closely related compounds to one of which, the analogue sought, he assigned the formula



$$C_6H_4<\substack{CO\\CO}>C : C<\substack{CO\\CO}>C_6H_4.$$

This diphtalylethene is red and can be obtained in small quantities by the action of bromine or silver upon dibromdiketohydrindene, $C_6H_4<\substack{CO\\CO}>CBr_2$ in benzene solution. [Ber. 30, p. 382.]

Origin of Pilocarpidine. *

Petit and Polonovski combat the theory of Hardy and Calmels that pilocarpidine is a decomposition product, but consider it to exist in the plant, since the absence of strong acids and alkalies, the action of boiling water alone cannot produce it in large quantities, seeing that it has but little action in pilocarpine, and even when heat is entirely avoided more or less pilocarpidine is always found. Again, operating under like conditions with different species of jaborandi, the yield of pilocarpidine is always found. Again, operating under like conditions with different species of jaborandi, the yield of pilocarpidine varies greatly, oscillating between 5 and 75 p. c. of the total alkaloids; and lastly it is usually found in greater proportion in the stems than in the leaves of the same plant.

[Journ. de Pharm. [6], v., p. 478.]

Butyric Fermentation.

Last year O. Emmerling (Ber. 29, p. 2726) reported that he did not succeed in successfully repeating the experiments of Fitz. After numerous attempts he at last obtained a variety of hay from which he obtained pure culture of the *bacillus butylicus* of Fitz, which he isolated by means of anaërobic methods. From 100 g. glycerin he obtained 6.3 g. pure normal butyric alcohol which was identified by means of its iodide. Mannitol yielded upon fermentation 10.5 g. butyl alcohol, whereas grape sugar yielded only ethyl alcohol. In all these instances considerable quantities of butyric acid resulted.

The same species was found in decaying wood. It is not identical with a closely related species of *Granulobacter saccharobutyricum* of which Beyerinck supplied pure cultures. With glycerin this yielded only ethyl alcohol, whereas with grape sugar it is stated to yield butyl alcohol. Neither of the two species break up cellulose, at least experiments gave negative results. [Ber. 30, p. 451.]

Fermentation with Moulds.

It is known that moulds will produce alcoholic fermentation under abnormal conditions. This is especially true of certain species of mucor, which in the absence of oxygen produce yeast-like forms in saccharine liquids and convert the sugar into alcohol. Fitz and Bufeld, also A. Mayer have made interesting chemical and botanical experiments along this line and have determined how much alcohol the fungus can produce without detriment to itself.

Pasteur has shown that in the true alcoholic fermentation by yeast glycerin and succinic acid are also found and that the amount stands in direct relation to the amount of alcohol.

O. Emmerling has now ascertained that the moulds produce glycerin in addition to alcohol and succinic acid (Fitz). He experimented with *Mucor racemosus*. The ratio of alcohol to glycerin to succinic acid was 22:1.83:0.31. In other words the glycerin amounted to 8.3 p. c. and the succinic acid to 1.4 p. c. of the alcohol, which is about the same average proportion found for yeast fermentation. [Ber. 1897.]

Pilocarpidine in Pilocarpine Salts. *

Continuing their researches on the jaborandi alkaloids, Petit and Polonovski state that the greater part of the commercial salts of so-called "pilocarpine" are in reality salts of the two bases. This is notably the case with the nitrate, the nearly equal solubility of the two nitrates, allowing them to crystallize together. While the greater number of samples of commercial hydrochloride of pilocarpine contained relatively little pilocarpidine, nitrate was frequently met with containing 50 p. c. of the latter base. This impurity may be readily detected by the lowering both of the melting point and of the rotatory power of the solution. Thus, the pure nitrate melts at 177–178° C., while a mixture of impure salt containing 50 p. c. of pilocarpidine nitrate softens at 140°, and is completely decomposed at 150°. Not only does the optical behavior indicate the purity or otherwise of the salt, but the observed figure allows, through Landolt's formula, of an approximate determination of the amount of the two nitrates present.

[Journ. de Pharm. [6], v., p. 475.]

Pilocarpic and Pilocarpidic Acids. *

So far from these acids being hypothetical, Petit and Polonovski have succeeded in isolating both in the free state, and find that they are fairly stable, particularly in the presence of water. The bases pilocarpine and pilocarpidine are regarded as anhydrides, which, when treated with fixed alkali, undergo hydrolysis, and the sodium salt of the acid is formed. From this the barium salt was prepared, and this, when decomposed with an exact equivalent of sulphuric acid, liberates the organic acids on evaporation. These are obtained in the state of amorphous varnishes. The acids are very soluble in water, but insoluble in ether and chloroform; the optical rotation is markedly lower than that of the original alkaloid. On heating, partial dehydration takes place with partial re-generation of the alkaloids. On the addition of an acid, even dilute, the alkaloid is rapidly regenerated. In very dilute acid solutions the gradual dehydration of the acid may be observed by the progressively increasing optical activity of the solution, until ultimately it reaches the figure for the pure alkaloid.

[Journ. de Pharm. [6], v., p. 481.]

Pilocarpine and Pilocarpidine. *

Petit and Polonovski are inclined to regard pilocarpine and pilocarpidine as isomers. The figures obtained by ultimate analysis are so close that the physical characters are by far the most important points of difference between the two alkaloids. If pilocarpine is regarded as the betaine of pyridine-trimethyl-ammonium-proprionic acid, it is difficult to account for the fact that pilocarpidine, which does not, according to the views held by others, possess the anhydric group, but is pyridine-dimethyl-ammonium-proprionic acid,

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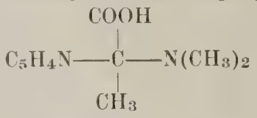
* Through Pharm. Journ.



$$C_5H_4N{-}\overset{\displaystyle COOH}{\underset{\displaystyle CH_3}{C}}{-}N(CH_3)_2$$

can yet furnish an acid by hydrolysis in a precisely similar manner to pilocarpine.

[Journ. de Pharm. [6], 5, 482.]

On the Alkaloids of the Lupines.

E. Schmidt and L. Sherman Davis have recently published a series of articles on the alkaloids contained in the seeds of various species of *Lupinus.* The object of the investigation was to throw light on conflicting statements of older literature, and to ascertain in how far the different species show a similarity or difference in chemical composition taking the alkaloids as a basis for comparison. The following species have thus far been examined *L. augustifolius* or blue lupine, *L. albus* or white lupine, *L. luteus* or yellow lupine, *L. niger* or black lupine, and *L. perennis* or the perennial lupine. The seeds of several species cultivated for ornamentation have also been found to contain alkaloids, but no further report than a mere statement is made thus far.

The alkaloids preexisting are

Dextrogyrate lupanine: $C_{15}H_{24}N_2O$
Inactive lupanine: $C_{30}H_{48}N_4O_2$
($+C_{15}H_{24}N_2O$ and $-$ $C_{15}H_{24}N_2O$)
Lupinine: $C_{21}H_{40}N_2O_2$
Lupinidine: $C_8H_{15}N$.

Of these the seeds of the blue lupine contain only o-lupanine; the seeds of the white lupine +lupanine and o-lupanine; those of the yellow and black lupine each lupinine and lupinidine; while the seeds of the perennial lupine contain +lupanine and an alkaloid not yet identified.

[Arch. f. Pharm. 235, p. 192—240.]

Corydaline.

Drs. J. J. Dobbie and F. Marsden, in a fifth communication on this compound, state that when it is heated on a water bath with very dilute nitric acid (about 1:20), a difficulty soluble nitrate, $C_{22}H_{29}HO_4.HNO_3$, is first formed. On further heating, the solution becomes dark red in color, and soon ceases to give any precipitate on testing with ammonia. If at this stage the solution be allowed to cool, groups of bright yellow prismatic crystals separate out on the sides of the vessel, consisting of the nitrate of a base—dehydrocorydaline—differing from corydaline by four atoms of hydrogen. The free base is very soluble in water and alcohol, and difficult to obtain in crystals. Solutions of dehydrocorydaline and its salts have an intense yellow color, and give a vivid green color with blue litmus. Reducing agents reconvert dehydrocorydaline into optically inactive corydaline. Further concentration of the acid solution until platinum chloride no longer gives a precipitate, causes yellow colored crystals of an acid melting at 218° to separate out on cooling. This is temporarily named corydic acid. It is readily soluble in hot water and in alcohol, but insoluble in ether. Its aqueous solution has an intense yellow color, and does not give precipitates with any of the metals in aqueous solution. The acid contains two methoxy-groups and is dibasic. Its formula is $C_{14}H_9N.(OCH_3)_2(COOH_2),\frac{1}{2}H_2O$.

[Proc. Chem. Soc., 179, 101.]

A Delicate Test for Nitrites.

About a year ago, Dr. E. Riegler in Fresenius' Zeit. für anal. Chem. recommended crystallized naphthionic acid as a reagent for nitrous acid. Since then he has discovered that the delicacy of the reaction depends largely upon the purity of the reagent and as a result he recommends the following modifications of the test:

Instead of naphthionic acid he uses an intimate mixture of this substance with an equal quantity of pure β-naphthol, which mixture can be kept indefinitely and to which he assigns the name: Naphthol-reagent for Nitrites. To apply the test, a small quantity (0.02—0.03 g.) of the reagent is added to about 15 ccs. of the suspected solution contained in a test-tube, after which 2—3 drops of concentrated hydrochloric acid are added, and the mixture thoroughly shaken for a minute. If now a cc. of concentrated ammonia water is allowed to run down the sides of the inclined tube, in the presence of nitrites a red ring will appear at the line of contact. The reaction depends upon the formation of diazonaphthalinsulphonic acid, which combines with β-naphthol to form an intensely red azo-compound.

The reaction is extremely delicate, rose-colored solutions being formed in dilutions of 1 to 100 million. The test can be applied to saliva or urine as well as to water. Instead of using the powder, a solution can be also prepared by dissolving 1 g. naphthionic acid, 1 g. β-naphthol and 0.5 g. sodium hydroxide in 200 ccs. of water; of this solution, about 10 drops are required for a test. On account of the comparative instability of the solution, the author prefers the use of the reagent in powder form.

[Pharm. Centralh.; 1897, p. 191.]

Alcoholic Fermentation without Yeast.

The interesting and valuable investigations of H. Buchner (See p. 94) have not lead to a new theory, but must be regarded as strengthening by experiment a theory already well established theoretically. This is claimed by G. Wendt who quotes from an article Ueber den Chemismus im lebenden Protoplasma, published by him in Haeckel's Jenaische Zeitschr. f. Naturw. f. 1893:—"The only conclusion remaining is that the excretions of the organisms constitute the ferments which causes the chemical breaking down. But these ferments are differently constituted than the heretofore characterized enzymes. Like all other similar excretion products, they themselves are capable of double decomposition. In the breaking down of the fermentable material they themselves break up."

[Pharm. Ztg. 42, p. 389.]

Testing of Quinine.

A further contribution to the controversy regarding Kubli's method for testing quinine is furnished by A. Weller. (See also p. 119.) The tenor of the article is on the whole strictly objective and deserving of the attention of quinologists and analysts. It cannot well be abstracted. [Pharm. Ztg. 42, p. 344.]

New Gold Salts of Solanaceous Alkaloids.[*]

H. A. D. Jouett of the Wellcome Research Laboratory, as reported at a recent meeting of the Chemical Society, has isolated and analyzed double salts of atropine and hyoscyamine hydrobromide respectively with gold chloride and finds them to possess the general formula $\overset{+}{B}HBr.AuCl_3$. The two salts differ merely, it appears, in shade of color. Although inorganic mixed double halides were pointed out to exist, attention was called to the supposed fact that this is the first instance of an organic mixed double halide.

[Chemist & Druggist 50, p. 914.]

The Distribution of Alkaloids.[†]

Apocynaceæ.

Alstonine (Chlorogenine), $C_{21}H_{20}N_2O_4$ (?), Alstonia constricta Rut.
Alstonidine, —, Alstonia constricta Rut.
Porphyrine, $C_{21}H_{25}N_3O_2$ (?), Alstonia constricta Rut.
Ditamine, $C_{16}H_{19}NO_2$, Alstonia scholaris R. Br. or Echites scholaris L.
Echitamine (Ditaïne), $C_{22}H_{28}N_2O_4$, Alstonia scholaris R. Br. or Echites scholaris L.
Echitenine, $C_{20}H_{27}NO_4$ (?), Alstonia scholaris R. Br. or Echites scholaris L.
Aspidospermine, $C_{22}H_{30}N_2O_2$, Aspidosperma Quebracho and other species of Aspidosperma.
$\left.\begin{array}{l}\text{Aspidospermatine}\\ \text{Aspidosamine}\end{array}\right\}$, $C_{22}H_{28}N_2O_2$, Aspidosperma Quebracho and other species of Aspidosperma.
Hypoquebrachine, $C_{21}H_{26}N_2O_2$, Aspidosperma Quebracho and other species of Aspidosperma.
Quebrachine, $C_{21}H_{26}N_2O_3$, Aspidosperma Quebracho and other species of Aspidosperma.
Quebrachamine, —, Aspidosperma Quebracho and other species of Aspidosperma.
Oleandrine, —, Nerum Oleander.
Pseudocurarine, —, " "
Paytine, $C_{21}H_{24}N_2O$, Payta bark (Aspidosperma species).
Paytamine, $C_{21}H_{24}N_2O$, " " " "
Geissospermine, $C_{19}H_{24}N_2O_2+H_2O$, Geissosperma Vellosii.
Pereirine, $C_{19}H_{24}N_2O$ (?), " "
Vellosine, $C_{23}H_{28}N_2O_4$, " "
Conessine (Wrightine), $C_{12}H_{20}N$, Wrightia antidysenterica R. Br. (Cortex conessi).
Johimbine, $C_{23}H_{32}N_2O_4$ or $C_{21}H_{28}N_2O_3+\frac{1}{2}HO_2$, Tabernaemontana species.
Johimbenine, —, Tabernaemontana species.

Araliaceæ.

Hederine, —, Hedera Helix.

Aristolochiaceæ.

Aristolochine (?), —, Aristolochia reticulata Nutt. and A. argentina.
Aristolochine, $C_{32}H_{22}N_2O_{13}$ (?), Aristolochia clematis, rotunda and longa.
Unknown alkaloid, —, Bragantia Wallichii.

Asclepiadaceæ.

Marsdenine, —, Cynanchum erectum.

Berberidaceæ.

Berberine, $C_{20}H_{17}NO_4$, Berberis vulg. & aquif.
Berbamine, $C_{18}H_{19}NO_3$, " " "
Oxyacanthine, $C_{19}H_{21}NO_3$, " " "
Nandinine, $C_{19}H_{19}NO_4$, Nandina domestica.

Borraginaceæ.

Cynoglossine (= Heliotropine?), —, Cynoglossum officinale & Heliotropium europæum.

Buttneriaceæ see *Sterculiaceæ*.
Buxaceæ see *Euphorbiaceæ*.

Cactaceæ.

Anhalonine, $C_{12}H_{15}NO_3$, Anhalonium Lewinii (Mescal Buttons.
Anhalonidine, $C_{12}H_{15}NO_3$, Anhalonium Lewinii (Mescal Buttons).
Mezcaline, $C_{11}H_{17}NO_3$, Anhalonium Lewinii (Mescal Buttons).
Sophophorine, $C_{13}H_{17}NO_3$, Anhalonium Lewinii (Mescal Buttons.)
Anhaline, $C_{10}H_{17}NO$, Anhalonium fissuratum.
Pellotine, $C_{13}H_{19}NO_3$, " Williamsi.

Caesalpiniaceæ see *Leguminosæ*.
Camelliaceæ see *Ternstroemiaceæ*.
Cannabineæ see *Urticaceæ*.

Caprifoliaceæ.

Coniine, —, Sambucus nigra.

Caryophyllaceæ: Sileneæ.

Agrostemmine, —, Agrostemma Githago.

Celastraceæ.

Celastrine, —, Celastrus edulis.

Chenopodiaceæ.

Trimethylamine, $(CH_3)_3N$, Chenopodium vulgaria.
Chenopodine, $C_6H_{13}NO_4$, " album.
Betaïne, $C_5H_{11}NO_2$, " "

Compositæ.

Anthemine, —, Artemisia arvensis.
Chrysanthemine, $C_{14}H_{38}N_2O_3$, Chrysanthemum cinerariæfolium.
Parthenine, —, Parthenium Hysterophorus L.
Eupatorine, —, Eupatorium cannabinum.
Baccharine, —, Baccharis cordifolia D. C.
Hyoscyamine, $C_{17}H_{23}NO_3$, Lactuca sativa and L. virosa.
Cirsiine, —, Cirsium arvense.
Pellitorine, —, Anacyclus Pyrethrum.
Senecionine, $C_{18}H_{25}NO_6$, Senecio vulgaris.
Senecine, —, " "

Cruciferæ.

Sinapine, $C_{16}H_{23}NO_3$, Sinapis alba.

Cucurbitaceae.

Trianospermine, —, Trianosperma ficifolia.
Trianospermitine, —, " "

Ericaceae.

Andrometoxine, —, Andromeda japonica etc., Cassandra, Azalea, Rhododendron, Kalmia, Pieris.

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[*] It may be true, as far as the writer is aware without looking up the literature on the subject, that this is the first instance of a mixed double halide with a natural alkaloid as the base. However, five years or more ago the writer had mixed double halides prepared in the pharmaceutical laboratory of the University of Wisconsin with benzylamine and aniline as bases. A partial report appeared in the Proc. Wisc. Pharm. Assn. of the same year. Ed.

[†] Continued from p. 119.

Erythroxylaceae.

Cocaïne, $C_{17}H_{21}NO_4$, Erythroxylon Coca.
Benzoylecgonine, $C_{16}H_{19}NO_4+4H_2O$, “ “
α-Hygrine, $C_8H_{15}NO$, “ “
β-Hygrine, $C_{14}H_{24}N_2O$, “ “
Isatropylcocaïne, $C_{19}H_{23}NO_4$, “ “
Benzoyl-pseudotropeïne, $C_{15}H_{19}NO_2$, “ “ (from Java).

Euphorbiaceae incl. *Buxaceae.*

Ricinine, $C_{17}H_{18}N_4O_4$, Ricinus communis.
Mercurialine (methylamine), CH_3NH_2, Mercurialis annua.
Minaline (v. Parodi), —, Croton minal Parodi.
Buxine, $C_{16}H_{21}NO_3$, Buxus sempervirens.
Parabuxine, $C_{26}H_{48}N_2O$ (?), “ “

Fumariaceae.

Corydaline, $C_{22}H_{27}NO_4$, Corydalis tuber, cava etc.
Bulbocapnine, $C_{19}H_{19}NO_4$, Corydalis cava.
Corytuberine, $C_{19}H_{25}NO_4$, “ “
Corybulbine, $C_{21}H_{25}NO_4$, “ “
Corycavine, $C_{23}H_{23}NO_6$, —
Fumarine, $C_{21}H_{19}NO_4$, Fumaria officinalis.

Labiatae.

Stachydrine, $C_7H_{13}NO_2$, Stachys tuberifera.

Lauraceae.

Nectandrine, $C_{20}H_{23}NO_4$ (?), Nectandra Rodiæi Schomb.
Bibirine or Bebeerine, $C_{19}H_{21}NO_3$ (?), Nectandra Rodiæi.
Sipirine (?), —, “ “
Laurotetanine, —, Litsæa chrysocoma.

Leguminosae. a) *Papilionaceae.*

Trigonelline, $C_7H_7NO_2$, Trigonella fœnum græcum.
Sparteïne, $C_{15}H_{26}N_2$, Spartium scoparium.
Lupinine, $C_{21}H_{40}N_2O_2$, Lupinus luteus etc.
Lupinidine, $C_8H_{15}N$, “ “ and albus.
Lupanine[1], $C_{15}H_{24}N_2O$, “ augustifolius and albus.
Lupanine[2], “ “ albus.
Eserine (Physostigmine), $C_{15}H_{23}N_3O_2$ (?), Physostigma venenosum.
Eseridine, $C_{15}H_{23}N_3O_2$, (?), Physostigma venenosum.
Eseramine, —, “ “
Calabarine, —, “ “
Cytisine, $C_{11}H_{14}N_2O$, Cytisus laburnum.
Anagyrine, $C_{14}H_{18}N_2O_2$, Anagyris fœtida.
Arginine, $C_6H_{14}N_4O_2$, In seedlings from vetch.
Vernine, $C_{16}H_{20}N_8O_8+3H_2O$, Vicia, sativa.
Vicine, $C_{28}H_{51}N_{11}O_{21}$ (?), Vicia Faba & V. Fab. minor.
Convicine, $C_{10}H_{14}N_3O_7+H_2O$ (?), “ “ “ “
Choline, $C_5H_{15}NO_2$, Vicia sativa, Pisum sativum.
Betaïne, $C_5H_{11}NO_2$, “ “ “ “
Angeline, $C_{10}H_{13}NO_3$, Ferreira spectabilis.
Coralloidine or Erythroidine, —, Erythrinum coralloides.
Baptitoxine (?), $C_{11}H_{14}N_2O$, Baptisia tinctoria R. Br. and Baptisia australis.
Vinaline v. Parodi, —, Vinal (Prosopis ruscifolia Gries).
Hypaphorine, —, Hypaphorus subumbrans.

b) *Caesalpiniaceae.*

Erythrophleïne, $C_{20}H_{27}N_3O_2$, Erythrophleum guineense.
Surinamine, $C_{10}H_{13}NO_3$, Geoffroya surinamensis.
Andirine, $C_{10}H_{13}NO_3$, Andira inermis.

c) *Mimoseae.*

Paucine, $C_{27}H_{39}N_5O_5$ (?), Pentaclethra macrophylla Graine d'Owala).
Sophorine, $C_{11}H_{14}N_2O$, Sophora tomentosa & S. speciosa.
Matrine, $C_{15}H_{24}N_2O$, “ angustifolia.
Erythrine, —, Erythrina (s. Stenotropis) Broteroï Hassk.
—, —, Crotolaria retusa L.
—, —, Acacia tenerrima Jungh.
—, —, Pithecolobium Endl.

Botany and Pharmacognosy.

Basilicum Oil.

On p. 94 of this journal an abstract of the work of Bertram and Walbaum will be found. It might be added that the pinene identified was found to be dextrogyrate and that a detailed report is to be found in the journal accredited below.

[Arch. f. Pharm. 235, p. 176.]

Guaiac Resin.

Herzig and Schiff compare the results obtained by Doebner and Luecker (Arch. f. Pharm. 234, p. 593) with those obtained by one of them about two years ago (Ber. 28, p. 866). They point out that the apparent differences brought out in the two reports are not actual. An abstract of this comment without the results of the earlier reports would be of little value and those especially interested will have to consult the originals. [Ber. 30, p. 378.]

Castor Oil.

Hans Meyer supplements the results which he published about the chemistry of castor oil in 1890 (Arch. f. experim. Pathol. u. Pharmacol. 28, p. 145). The present paper is principally a reply to Juillard, (Bull. de la soc. chim. de Paris [3] 13, p. 283). Those who are interested in the controversy will have to consult the originals, since an abstract will not do justice to either party.

[Arch. f. Pharm. 235, p. 184.]

The Root of Phytolacca Decandra.

George B. Frankforter and Francis Ramaley report the results of a second chemical investigation of poke root. The results of two proximate analyses are given. Besides potassium nitrate and calcium oxalate, cane sugar was obtained in a crystalline form. These, however, were not pure, containing only 87.6 p. c. of sucrose. Sugars reducing Fehling's solution to the extent of 4.4 p. c. and calculated as dextrine but not identified, as such were found to be present. The other impurities were not determined. Reactions for an alkaloid or alkaloids were obtained, but no substance of an alkaloidal nature was isolated. The investigation evidently is to be continued.

[Am. Journ. Pharm. 69, p. 281.]

Celery Oil.

Ciamician and Silber have examined the high-boiling fractions of celery oil and have isolated the following substances:

A terpene-like substance, probably of the formula $C_{15}H_{24}$;

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[1] Siebert.
[2] Soldaini.

Palmitic acid and phenol like substances;

A lactone-like substance of the formula $C_{12}H_{18}O_2$; and

An acid of the formula $C_{12}H_{18}O_3$.

It still remains to be determined whether all of these substances preexist in the fruit or whether in part they are formed during the process of distillation. The authors are of the opinion, however, that the lactone preexists in the fruit since to it the odor of the fruit is largely due. The acid $C_{12}H_{18}O_3$, on the other hand, does not preexist since it cannot be extracted with carbonated alkalies. Of palmitic acid and phenols but small quantities were obtained. The acid $C_{12}H_{18}O_3$ is termed sedanonic acid, a keto (-one) acid; the lactone, $C_{12}H_{18}O_2$, sedanolid, is the inner anhydride of sedanolic acid, $C_{12}H_{20}O_3$, an alcohol (-ol) acid.

The keto acid receives special attention in a second contribution. The oxime, when treated according to Beckmann's method (Umlagerung und Aufspaltung der Ketoxime) yielded normal butylamine and a dibasic acid, $C_8H_{10}O_4$, a tetrahydrophthalic acid.

[Ber. 30, pp. 492 and 501.)

Periploca graeca.

This member of the natural order *Asclepiadaceæ* is found by Prof. Eduard Lehmann to contain an organic principle, a bitter glucoside called by him *periplocin*, which acts on the heart and blood pressure equally with *Strophanthus* and *Apocynum cannabinum*. This plant has a weak woody development and climbs on tree trunks by twining. The long, cylindrical rhizome, little different from the aërial stem, either creeps on the earth or slightly below its surface and sends out both aërial and short, little branching, subterranean roots. In old specimens, the stem reaches a length of over 8 meters and a diameter at the surface of the soil of 2½ cm. The smooth, opposite, entire leaves are oblong, oval, cordate at the base, acuminate at the apex. The axillary, corymbose inflorescence is made up of relatively small, inconspicuous flowers. The fruit consists of two cylindrical capsules united at both base and apex and reaches a length of 10 cm. The seeds are numerous, with long, hairy, pencil-shaped coma.

All green parts of the plant, especially the juicy bark, the leaves and unripe fruit contain an exceedingly bitter, white milk juice, found in much branching latex vessels. When these parts are bruised, a weak but distinct odor resembling the volatile oil of bitter almonds is detected.

[Arch. d. Pharm. 235, p. 157.]

The Tonka Bean.

Director J. H. Hart of the Royal Botanical Gardens, Trinidad, reports the following about the tonka bean:

The tonga, tonquin or tonka bean is the product of a tree known to botanists as *Dipterix odorata* Willd., and less frequently as the *Coumarouna odora* Aublet. The latter name according to the Index Kewensis is the *nomen primus*.

The tree thrives well in Trinidad when planted in shady, damp situations, and is very abundant in the forest of the neighboring mainland of Venezuela. The fruit or seed ripens in June and July, and in these months large shipments are received in Trinidad from South American ports.

The beans are sent to Trinidad for preparation for European and American markets. For this purpose they are conveyed to warehouses, where, under customs regulation, they are steeped in rum for a certain time, and are then spread on the floors in layers nine to twelve inches in thickness, to undergo a kind of fermentation and decay, during which process white crystals are developed on the outside of the bean. As much as £30,000 worth have been imported and re-shipped during a single year. The tree grows some sixty or more feet high. The solitary seed is borne in a drupe-like pod, which does not open at maturity. The seed, when ripe, so soon loses its vitality that it is at times difficult to procure supplies for raising plants.

[Bull. of Pharm. 11, 269; from Bulletin of Miscell. Information.]

Japanese Uses of Burdock.

The burdock (*Arctium Lappa*, *A. tomentosa* and *A. minor*), aside from its character as a pest, is best known to Americans as a medical plant. In Japan, however, according to Inazo Nitobe, it is largely cultivated as a vegetable. It is commonly known as *Gobo*, *Kitakisu* and *Uma-fuki* (horse Nardosmia). The Ainu know it as *Setakorokoni* (dog Nardosmia). The Ainu and Japanese prefixes, *seta* and *uma*, are applied to plants with the same meaning as "dog" and "horse" as in dogwood and horsemint in the English. The Ainu boil the tender shoots with beans, and the roots are put into soup. In 1888, seventy-two million pounds of burdock-root, valued at 422,134 yen (a yen equals one dollar), were raised in Japan. This is not much to be wondered at when it is remembered that burdock ranks high in the scale of nutritive plants, containing more nitrogen (5.6 percent) than potatoes, carrots, beets and turnips, in fact, very few roots or tubers approaching it.

There are many varieties, but the best known are few and are usually named after the place near which they were developed. The Owura variety attains a size of one and a half feet in circumference and two and a half feet in length, this variety, in form like the beet, selling at about twenty sen (a sen equals one cent) apiece.

A sandy soil is commonly thought to be the best for cultivating the root, but it is apt to make the burdock-root hollow in the center and tough at the rind. A clayey loam imparts firmness to the root and a better flavor. The soil should be plowed deeply and should be finely pulverized. The plant thrives better if planted continuously in the same soil, and is grateful for good manures. The seeds are planted in April or May (or August if for spring use) in rows three feet apart, and five or six together every six or eight inches in a row. In the early part of June the young plants are thinned out to one plant in a hill. Liquid manure is often applied two or three times between the thinning and harvesting, which occurs late in December.

The roots are peeled and sliced thin, boiled with soy (soja bean), salt or Spanish pepper for flavoring. If boiled alone, they may afterward be browned with sesame oil. They may also be peeled or scraped, sliced into thin pieces, boiled until soft, mashed and made into small cakes and treated in the same manner as oyster plant. A sort of salad is also prepared from them, though not uncooked. A more elegant way of preparing them is to stuff the roots with sea-eel, dipping them into a preparation of soy and pepper and then boiling them. The root is oftenest sliced, fried, and eaten with condiments.

[Bull. of Pharm. 11, 268; from Garden and Forest.]

India Rubber, Sources and Cultivation.

In view of the constantly increasing use of India rubber during recent years in electrical technique and for tires of bicycles and other vehicles, the rapid depletion of the South American forests furnishing Para rubber, has caused not a little disquietude in the minds of those most directly interested.

Mr. John R. Jackson of the Royal Kew Gardens, England, reviews the present resources of the world in regard to India rubber and concludes that at present it is necessary to prevent as far as possible all waste both of the product itself and of the plants yielding it. He regards the prospect for the future, however, as hopeful, since the resources of tropical Africa of late have increased rapidly enough to offset the loss from American sources. While the Para rubber from *Hevea braziliensis* is of a quality superior to that from other sources, we are in little danger of an absolute failure of the general rubber supply.

The Para rubber was that first discovered, appearing in London in 1770 as a new means for rubbing out pencil marks on paper and commanding a price of about seventy-five cents per cubic inch. At the beginning of the present century, it began to find use in the treatment of woven fabrics for air tight and water proof articles. Importation into England increased rapidly, as is shown by the following statistics:

Year.	Amount.
1837	141,735 pounds.
1857	3,477,445 "
1896	48,290,368 "

The importation of 1896 was valued at £4,993,166.

As far back as 1873, the necessity of providing for a supply in the future occupied the attention of the Kew authorities, and living plants of *Hevea braziliensis* were sent to India in the hope of establishing the plant there. Smaller consignments were made to the West Coast of Africa, Jamaica, Dominica, Trinidad, Singapore, Queensland and Java.

In addition to this plant, *Manihot Glaziovii*, a native of Central America and likewise a member of the order *Euphorbiaceæ*, furnishes a kind of rubber known as "Ceara Scrap" from the fact that this sort always appears in commerce in masses composed of agglomerated scraps. In 1876, a large quantity of seeds and plants of this species was collected in Central America and brought to Kew. They were rapidly propagated and plants were sent to Ceylon, Singapore, Calcutta and other places, in most of which the plant grew rapidly and yielded rubber, demonstrating their capability of establishing themselves in their new homes.

The Nettle family, *Urticaceæ*, contains a number of rubber-producing plants. Important among these is *Castilloa elastica* and allied species, which furnish the Guatemala, Mexico and West India rubbber. *C. elastica* received much attention at Kew and in 1876 was widely distributed.

The source of Assam rubber, which is shipped from Calcutta, is the plant well known with us as a house plant bearing fine, glossy leaves, *Ficus elastica*. A related species, *F. Vogelii*, from West Africa furnishes a kind of Lagos rubber, in quality rather inferior, because of its resinous character.

The *Apocynaceæ*, the Dogbane family, contains a number of rubber-producing plants. Several species of the genus *Landolphia*, climbing, shrubby plants with stems four to six inches in diameter, furnish the rubber commercially known as African rubber.

Landolphia owariensis, *L. florida* and *L. Kirkii* are especially valuable species.

Lately the discovery of a new source for Lagos rubber of a most excellent quality has given a great impetus to the trade of the West Coast of Africa. The plant concerned is *Kicksia Africana*, a tree fifty to sixty feet high, having a stem twelve to fourteen inches in diameter. January 1895 practically marks the beginning of this industry: The exports at this time were 21,131 pounds, valued at £1,214, and at the end of December of the same year the total export for the year was 5,069,506 pounds, valued at £269,892.

Among plants of minor importance as rubber producers are *Willughbeia* and *Leuconitis* of the far East. *Alstonia flexuosa* of the Fiji Islands and *Forsteronia floribunda* and *F. gracilis* in Jamaica and Demerara yield rubber in small quantities.

[Bull. of Pharm. 11, 254; from Nature.]

Culilaban Oil.

The distillation of culilaban bark from *Cinnamomum culilavan* Nees yielded 4 per cent of oil, having a sp. gr. of 1.051, a strong odor of eugenol; on account of its dark color the determination of its rotatory power could not be made. Inasmuch as the composition of this oil was not sufficiently known, it was submitted to an examination.

The phenol contained therein was isolated by agitating the oil with dilute solution of sodium hydrate and by subsequent separation by means of dilute sulfuric acid. The phenol obtained had a boiling point of 251° to 253° and a sp. gr. of 1.071 at 15°, corresponding to those of eugenol. The benzoyl compound obtained therefrom has the same melting point as benzoyl-eugenol, 70° to 71°. The phenol of culilaban oil, therefore, is identical mith eugenol.

The remainder of the oil, derived of the phenol, boiled at 100° to 130° under a pressure of 10 mm.; the main fraction, boiling at 125° to 130°, was heavier (sp. gr. 1.034), the fractions with a lower boiling point were lighter than water. The main fraction distilling at 249° to 252° under common atmospheric pressure yielded upon oxidation by means of potassium permanganate veratric acid with a melting point between 179° and 180°.

The silver salt crystallizing in needles from an aqueous solution was used for analysis; 0.2508 Gm. of silver salt yielded 0.0938 Gm. Ag:

calculated for $C_9H_9O_4Ag$	found
37.37 per cent Ag.	37.40 Ag.

This result, as well as the boiling point of the fraction indicate, methyleugenol. By bromation of a part of the fraction, tribrommethyleugenol melting at 77° was obtained.

According to the result of this examination, culilaban oil consists mainly of eugenol, and contains besides some methyleugenol and a small amount of constituents of a lower specific gravity than water.

[Rep. Schimmel & Co., April '97, p. 14.]

Lemon Oil.

Of considerable importance, particularly in legal controversies, is the question whether normal lemon oil contains or does not contain pinene. In order to get at the truth, we distilled 50 kilos of lemon oil employing a vacuum cooler. The first distillates—about 1 kilo—were subjected to repeated fractional distillations, aiming at the fraction passing over at the lowest temperature; this boiled at the temperature of 172°. Below this temperature, 8 cc., equal to 0.016 per cent passed over, and this was wanting in all of the properties of pinene. Pure lemon oil therefore, does not contain pinene; if so, it is adulterated with turpentine oil.

In former investigations, at the time when a discrimination between pure and sophisticated oil could not be ascertained, pinene had been found in lemon oil and was considered a constituent of the same. In conformity with the present state of knowledge, there can be no doubt that the oils then examined contained turpentine oil.

From recent investigations we obtained the evidence that the sophistication with turpentine oil is again much in vogue; we have met with commercial oils containing as much as 60 per cent of turpentine oil.

[Rep. Schimmel & Co., April '97, p. 20.]

New Remedies.

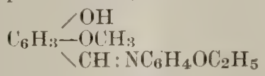
Cordol.

Under this name Gehe & Co. have placed upon the market tribromsalol, recommended as a sedative, antirheumatic, and antineuralgic. It is a crystalline powder of melting point 195°, insoluble in water and but difficultly soluble in alcohol and ether. Dose per day 2.0 to 6.0 g.; single dose 0.5—2.0 g. The acetyl and methyl compounds of cordol have also been prepared and will be subjected to clinical examinations.

[Pharm. Zeit., 1897, p. 325.]

Vanillin-p-phenetidine.

This new antineuralgic was first prepared by Dr. Carl Goldschmidt, in Frankfurt a. M., by heating vanillin with p-phenetidine to 140°. The condensation product



$$C_6H_3\begin{cases}OH\\OCH_3\\CH:NC_6H_4OC_2H_5\end{cases}$$

crystallized from hot water, melts at 97°. It has only a slight toxicity, and differs from other known p-phenetidine compounds with aldehyde, not only in being water-soluble, but also in combining hypnotic with antineuralgic properties.

[Pharm. Centralh., 1897, p. 353.]

Naphthionic Acid.

This substance, on account of its property of forming diazonaphthylaminsulphonic acid in contact with nitrous acid, has been proposed by Dr. Riegler as a remedy in acute iodism. The administration of six 0.5 g. doses were productive of good results. Similarly favorable were the results in case of disease of the bladder due to alkalinity of the urine. Riegler recommends for this purpose 3—4 g. of the acid daily, in doses of 0.5 g., preferably accompanied by washing of the bladder with a 0.1 p. c. solution of the same substance. The same author also recommends the use of naphthionic acid in cases of poisoning by nitrites.

[Pharm. Zeit., 1897, p. 284.]

Kryofine.

This new antipyretic, like phenacetine a p-phenetidine derivative, is a condensation product of p-phenetidine and methyl glyconic acid. It is obtained by heating these two substances to 120—130°, and can be crystallized from water in needles of melting point 98 to 99°. The formation of the phenetidine methyl glycolate can be expressed by the following equation:

$$CH_3OCH_2COOH + NH_2C_6H_4OC_2H_5 = CH_3OCH_2CONHC_6H_4OC_2H_5 + H_2O.$$

Kyrofine forms white odorless crystals, almost tasteless, and therefore can be administered in powders. It is soluble in 52 parts of boiling or 600 parts of cold water, the concentrated solutions having a sharp, bitter taste. The dose as an antipyretic is 0.5 g., being therefore only half that of an equally effective quantity of phenacetine. Later researches seem to have also proved the efficiency of kryofine as an antineuralgic. This new remedy was first manufactured by Dr. Bischler and introduced into the market by the Chemische Fabrik Bindschedler in Basel, Switzerland.

[Pharm. Zeit., 1897, p. 283.]

Benzylmorphine.

The method of preparing this morphine derivative, as patented by E. Merck, consists in allowing benzylhalogen to react with morphine, preferably in the presence of alkali and some diluent (alcohol). The benzylmorphine formed is changed to the difficultly soluble hydrochlorate by the addition of hydrochloric acid, and isolated as such. Benzylmorphine is readily soluble in alcohol, ether, and benzol, crystallizing from these solvents in large shining prisms or plates; its constitution is $C_{17}H_{18}NO_2.O.CH_2C_6H_5$. In neutral solutions it does not give the blue coloration with ferric chloride that is characteristic of morphine. Benzylmorphine is said to have many advantages over the other known alkylesters of morphine, especially over methylmorphine (codeïne). Its narcotic action is much stronger than that of the latter, while the unpleasant secondary effects of morphine are entirely absent.

[Pharm. Zeit., 1897, p. 327.]

Monochlor-metacresol.

Upon chlorinating metacresol, the dichlor-compound is readily formed. A pure monochlor substitution product can however be produced if the reaction is conducted at sufficiently low temperatures, and the cresol is quite dilute, glacial acetic acid, benzol, and water being the best diluents for this purpose. The chlorine can either be introduced directly into the solution, or indirect chlorination methods (by means of sodium hypochlorite, e. g.) may be employed.

Monochlor-metacresol boils at 235° without decomposition. From ligroin it can be obtained in large crystals, melting at 66°. It dissolves readily in ether, alcohol, benzol, and glacial acetic acid, and is also soluble to a large extent in warm glycerin or in dilute alkaline solutions. In contrast to parachlorphenol it is absolutely odorless, on which account it has been proposed as a substitute for this disinfectant.

[Pharm. Zeit., 1897, p. 211.]

Physiology and Therapy.

Opotherapeutic Preparations and Animal Extracts.

Thanks to a great number of encouraging clinical experiments enormous progress has been made in the development of organo-therapeutic research. The secretions and excretions of the glands of the animal organs have ceased to be merely theoretically and physiologically interesting since it had been satisfactorily demonstrated that, by the incorporation of secretions of healthy animal glands, it is possible to remove anomalies existing in the human system and thus to neutralize irregularities in the metabolic process. The results of chemical and biological research have been utilized in practical medicine with dexterity and success, and the old, almost forgotten principles of healing human diseases with the aid of products extracted from animal organs have been revived and placed upon a scientific basis, which had previously been wanting. On the other hand, the organo-therapeutic treatment requires chemists to produce animal materia medica which are therapeutically effective and which satisfy all the requirements of modern research (vide Poehl, Wratsch 1892.

The organo-therapeutic principle was until recently carried out by employing fresh organs as such or the dried pulverized substance of these organs. Although the results were in many cases very satisfactory, yet it is not rational to use these preparations. Their employment is, in fact, suggestive of an attempt to push the axiom of Hahnemann, "*Similia similibus*", so far as to administer liver for liver complaints, calf's brain for diseases of the brain, etc. There is no intention to use the organs as such, these are merely vehicles of their useful secretions, much in the same way as in nature metabolism is influenced not by the tissues, but by their diffusable products. Modern investigations, in particular the observations of A. Gautier and Landi (Comptes rend., Acad. scienc. tome CXIV, pp. 374, 1048, 1154, 1312 and 1419) have shown that the animal tissues, like many micro-organisms, may optionally exist under aërobic and anaërobic conditions and that the anaërobic existence of the tissues has, after the death of the animal, considerable influence upon the chemical nature of the tissue fluid. Poehl (Russ. Journ. für med. Chem. and Pharm. 1893, pp. 157 and 283) has directly proved that during the preparation, by drying in vacuo, of the glandular extracts, a series of therapeutically important substances vanish, which he ascribes to the anaërobic activity of the glands, since during slow drying processes he has found it impossible to avoid this post-mortem function of the glandular tissue cells (anaërobic life). In conformity with modern requirements, only the isolated active components of the organs should be applied in medicine.* Unfortunately, our knowledge in this department is as yet very deficient. By the investigations of Poehl (vide E. Merck's Ann. Rep. 1893, p. 80; Deutsch. med. Wochenschr. 1892, No. 21, and elsewhere) it has been shown that all the organs which are employed for therapeutic purposes contain an element common to all, viz. spermine, to which probably is due, to a great extent, the general tonic effect of these substances. The organs contain, however, besides, other substances possessing specific therapeutic properties. For this reason Poehl (Deutsch. med. Wochenschr. 1895, Nos. 30 and 31; Russ. Journ. für med. Chem. and Pharm. 1895, p. 314, and elsewhere) has made an attempt to substitute for the organs or their tissue substance the leucomaines contained in the fluid of the organs, i. e. the basic bodies regularly and continuously formed by the physiological processes going on during the decomposition of the proteïn substances. Since the tissue-forming substance and the so-called precipitable albuminoids do not participate in the healing processes, their diminution is *a priori* desirable from a practical point of view. But if, in addition, it be borne in mind that their elimination implies also that of a whole series of other bodies belonging to the group of toxic proteïdes, this course should be regarded as an absolute necessity. The risk of meeting with toxic proteïdes does not exist in all glands alike, yet it is certain that it is present in some of the glands. Great importance attaches therefore to the elimination of the precipitable albuminous bodies, especially as the physiological action of the leucomaines is not thereby affected. As it happens, many of the leucomaines form with chloride of sodium double salts, which are freely soluble in water and highly diffusive. I intend therefore to transform the leucomaines contained in the organs into double salts of this kind.

In order to obtain pharmaco-dynamically uniform preparations, the admixture of chloride of sodium is such that 1 part of the preparation corresponds to 10 parts of the fresh tissue matter of the particular organ. These preparations are distinguished from those obtained by the ordinary process of drying or other methods by the prefix "Opo" (derived from ὀπός = juice, sap). This same prefix has been employed by Landouzy (Rép. de Pharm. 1896, p. 163) in the formation of the term "opotherapeutics", which this writer has suggested in place of the word "organo-therapeutics". It is intended to open the series of the "opo-preparations" with the following substances, some of which are already in process of manufacture:

Opothymiinum, from the thymus of the calf.
Opothyroidinum, from the thyroid gland.
Opohypophysinum, from the pituitary gland.
Opomedullinum, from the red bone marrow.
Oporeniinum, from renal tissue.
Opolieninum, from splenic pulp.
Opoorchidinum, from the testicles.
Opoosiinum, from bone marrow.
Opoprostatinum, from the prostate.
Oposuprarenalinum, from the supra-renal capsule.

[Merck's Report for the year 1896, p. 106.]

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* Vide also A. Gautier, Les toxines microbiennes et animales. Paris, 1896, pp. 282, 358 and 464.

Literary.

Books and Pamphlets Received.

R. Gaertner's Verlagsbuchhandlung—Berlin. Anleitung zu analytisch-chemischen Uebungsarbeiten auf pharmaceutischem und toxikologischem Gebiete. Zugleich als II. Auflage von Prof. Dr. Arthur Meyers Handbuch der qualitativen chemischen Analyse. Bearbeitet zum Gebrauche in pharmaceutisch-chemischen Laboratorien von Dr. Eduard Schaer und Dr. Paul Zenetti. Ein Bd., pp. v, 178. 1897.

—— Chemisch-technisches Repertorium. Uebersichtlicher Bericht über die neusten Erfindungen, Fortschritte und Verbesserungen auf dem Gebiete der technischen und industriellen Chemie mit Hinweis auf Maschinen, Apparate und Litteratur. Herausgegeben von Dr. Emil Jacobsen. 35. Jahrgang, 1896. Zweites Halbjahr, zweite Hälfte.

Verlag von Julius Springer—Berlin. Erstes Dezennium der Helfenberger Annalen 1886|1895. Eine Zusammenstellung der Werte, Methoden und Studien. Herausgegeben von Eugen Dieterich, Königl. Sächs. Hofrat. Ein Bd., pp. xvi, 462. 1897.

Verlag von Fr. Eugen Koehler—Gera-Untermhaus. Koehler's Neuste und wichtigste Medicinal-Pflanzen in naturgetreuen Abbildungen mit kurz erklärendem Texte. Ergänzungsband zu dem in den Jahren 1883 bis 1890 erschienenen Hauptwerke in zwei Bänden. Lieferungen VIII, IX, X und XI. 1897. M. 1.00 für je zwei Lieferungen.

Deutsche Verlags-Anstalt—Stuttgart. Lexikon der gesamten Technik und ihrer Hilfswissenschaften. Herausgegeben von Otto Lueger im Verein mit Fachgenossen.
Lieferung XXI: Grundwasser—Herzstück, pp. 1—160.
Lieferung XXII: Hessische Kurve—Isolator, pp. 161—320.
Lieferung XXIII: Isolirschichten—Kataster, pp. 321—480.
1897. M. 5.00 pro Lieferung. Preis des ganzen Werkes M. 175.00.

Verlag von Gebrüder Borntraeger—Berlin. Grundprobleme der Naturwissenschaft. Briefe eines unmodernen Naturforschers von Dr. Adolf Wagner. Ein Bd., pp. vii, 255. 1897. M. 5.00.

École Supérieure de Pharmacie de Paris. Sur le dosage de la caféine. Thèse pour l'obtention du diplôme de pharmacien de 1re classe, présentée par Eugène Tassilly. Pamphlet, pp. 56. 1897.

—— Sur quelques oxydes doubles crystallisés obtenus a haute température. Thèse pour l'obtention du diplôme Pharmacien de 1re classe, présentée par M. Dufau (Louis-Émile-Revé). Pamphlet, pp. 32. 1897.

Author—Cincinnati. Quassia Amara; Hydrastis Canadensis; Strychnos Nux Vomica. Reprints from Western Druggist. Pamphlet, pp. 5, 545 resp. 1897.

The Western Druggist—Chicago. The Lloyd Library. Pamphlet, pp. 7. 1897.

University of Illinois.—An examination of some chemicals of commerce. Contributed by the chemical laboratory of the University of Illinois School of Pharmacy. Leaflet, pp. 4.

University of Wisconsin—Madison. Bulletins No. 358, 359 and 360 of the Agricultural Experiment Station.* 1897.

Author—Abdominal respiration. Migraine, its cause and radical cure. By Dr. J. H. Kellogg. Reprinted from Mod. Med. and Bact. Rev.

Schering and Glatz—New York. Eucaine hydrochlorate, a safe and reliable local anaesthetic. Pamphlet, pp. 80. May 1897.

—— Reprints from medical journals on glucol, xeroform, citrate and lactate of silver, guaiacol carbonate (duotal), creosote carbonate (creosotal) and betanaphtol-bismuth (orphol).

Lehn and Fink—New York. Papaïn: The vegetable pepsin, its origin, properties and uses. Pamphlet, pp. 18.

Stallman & Fulton — New York. Review and clinical notes on nosophene and its salts antinosine and eudoxine. Pamphlet, pp. 64. A short report on the use of antinosine in gynecology and obstetrics by Dr. Rudolf Mueller. Pamphlet, pp. 7.

Reviews.

Grundriss der Arzneimittellehre von Dr. Oswald Schmiedeberg, o. Professor der Pharmakologie und Direktor des pharmakologischen Instituts an der Universität zu Strassburg. Dritte umgearbeitete Auflage. Ein Bd., pp. x, 386. Verlag von F. C. W. Vogel, Leipzig. 1895.

This outline treats briefly of that part of the materia medica upon which the pharmacologist is entitled to pass judgment. It is therefore neither a formulary nor a compendium on therapeutics. The latter falls within the domain of the practicing or clinical physician. The scope and modern methods of treatment of practical medicine on the one hand and of pharmacology on the other hand no longer permit of the union of both branches in one person if the risk of dilletantism in the one or the other is to be avoided. The pharmacologist is to give to the physician that fundamental knowledge of medicinal substances or drugs without which the latter would grope in the dark, but it is not his duty to state just what should be done in a certain case or just how under given conditions a remedy is to be applied. Pharmacology is to direct the path, but therapeutics lies without the domain of the former.

Pharmacology has in recent years received a great impetus. Students of physiology, hygiene and medicine have shown a decided preference for pharmacological problems as subjects for their dissertations. Chemical and pharmaceutical manufacturers have issued numerous circulars concerning the pharmacological value of their preparations. Pharmacological literature has, therefore, increased enormously and it requires a master mind to sift the valuable from that which is less valuable or even valueless. The object of this outline is to give a brief survey over the more important fields of the science. It is not intended as a reference book.

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* The bulletins and annual reports of this station are sent free to all applicants of Wisconsin upon request.

The authors views on the nature of pharmacological action as expressed in the introduction and elsewhere are exceedingly interesting. He shows himself in touch with the most modern views of chemistry. The idea that the physiological action of salts is due to their dissociated irons finds a clear expression (p. 242) possibly for the first time, although the detailed experimental proof was apparently brought for the first time last year in the work accomplished in the School of Pharmacy of the University of Wisconsin.

It is all the more to be regretted that the author in general lays aside the study of the relation between chemical constitution and physiological action, because, as he puts it, the latter is not due to chemical constitution, but to the stereo-chemical configuration of the molecule. Stereo-chemistry and the study of the ions are but chapters of the larger field of chemical constitution. Although we cannot "know" the stereochemical configuration of molecules, as the author states, yet the study of this important branch, crude as it may be in its forms of expression, has yielded results of the very greatest importance. Might the furtherance rather than the suppression of this study not also yield important pharmacological results, as they have already yielded exceedingly interesting general biological results?

E. K.

Anleitung zu analytisch-chemischen Uebungsarbeiten auf pharmaceutischem und toxikologischem Gebiete. Zugleich als II. Auflage von Prof. Dr. Arthur Meyer's "Handbuch der qualitativen chemischen Analyse." Bearbeitet zum Gebrauche in pharmaceutisch-chemischen Laboratorien von Dr. Ed. Schaer, Professor der Pharmacie an der Universität Strassburg und Dr. Paul Zenetti, Assistent am pharmaceutischen Institute daselbst. R. Gaertner's Verlagsbuchhandlung, Berlin.

Thirteen years have elapsed since Prof. Meyer, now of the University of Marburg, published his Handbuch der qualitativen chemischen Analyse, of which this new manual appears somewhat in the nature of a second edition. However, on account of the large amount of new material introduced into medicine and the changes in analytical methods that have been instituted since that time, a complete revision of the former work was found necessary. The new work is not intended to replace the more complete compendia of pharmaceutical-chemical analysis, but merely to serve as a laboratory guide, which purpose it serves admirably. We therefore do not find a compilation of methods, but only those are given which in the experience of the authors have proved themselves thoroughly trustworthy.

The subject matter is divided into five chapters, of which the first treats of the reactions of the pharmaceutically most important acids and organic preparations; the second, of the tests for inorganic and organic poisons in mixtures with animal or vegetable substances; the third, of the volumetric analysis of pharmaceutical preparations; the fourth, of some physiological-chemical analysis, as the analysis of urine and of milk, and the identification of blood-stains; the fifth, of the assay of crude drugs and galenical preparations. Although the book is primarily intended for students of pharmacy preparing themselves for the German "Staatsexamen", it would serve as an excellent guide to any pharmacist in this country who, not having had the advantages of a good laboratory course in analytical work, wishes to study up the subject by himself.

Richard Fischer.

Der Hotelprofessor. Ein Genrebildchen aus dem Universitätsleben von Fritz Gregorovius. Gera, Julius Becker. Pamphlet, 8°, pp. 31. 1897. M. 0.30.

Der Verfasser beschäftigt sich mit einer Erscheinung im Universitätsleben, die vielleicht auch auf dieser Seite des Ozeans anzutreffen sein möchte.

Ein Professor der Medizin, bedeutend als Spezialist für Magenkrankheiten und geschickter Weltmann, zieht durch seine glücklichen Kuren eine solche Masse von Patienten an, dass die Universitätsklinik nicht mehr ausreicht, um diese Hilfesuchenden zu fassen. Als Menschenfreund (?) lässt er sich überreden, eine Privatklinik einzurichten, die aber auch bald dermassen überfüllt ist, dass man zu den Hotels in der Stadt seine Zuflucht nehmen muss, um seine Patienten unterzubringen. Der Ruhm des Hotelprofessors, wie man ihn scherzweise nennt, erreicht den Gipfelpunkt, als er den Landesfürsten durch ein glückliche Kur vom Tode rettet, selbstverständlich gegen ein aussergewöhnliches Honorar für einen so aussergewöhnlichen Fall. Bei seiner Rückkehr werden ihm Ovationen von allen Seiten zu Theil. Als er nun aber noch gar einen Ruf an eine grössere Universität ablehnt, da bringen die Studenten ihm einen Fackelzug, die Stadt macht ihn zum Ehrenbürger, der Fürst ernennt ihn zum Geheimrath. Die Studenten wollen zwar beobachtet haben, dass seine Vorlesungen immer später anfangen und immer früher aufhören. Das Honoror für die private Behandlung musste von dem Professor, diesem Wohlthäter der Menschheit, schon längst in die Höhe geschraubt werden, selbstverständlich nur, um den Andrang zu hemmen und den Professor vor Ueberbürdung zu schützen, und nur Schwerreiche können sich den Luxus einer solchen Spezialbehandlung gestatten.

Das Lukrative dieser Praxis reift schliesslich den Plan, sich mit anderen Spezialisten, ebenfalls Dozenten der Universität, zu verbinden und ein ärztliches Kompagniegeschäft en gros zu gründen, welches unter der Firma Morgenstern, Wolf & Co. in das Handelsregister eingetragen wird. Die Skrupel seiner Kollegen, dass sie vielleicht hierdurch zu sehr von ihren wissenschaftlichen Studien abgehalten werden möchten und nicht im Stande sein dürften, auch so noch ihren Pflichten der Universität gegenüber zur Genüge nachzukommen, werden durch die schlagenden Argumente des Professors Morgenstern, der Seele des ganzen Unternehmens, beseitigt.

Die Firma hat einen stark hebräischen Beigeschmack, wie überhaupt die ganze Pointe des Buches antisemitisch zu sein scheint. Das Ganze liest sich leicht und ist treffend geschrieben, und wenn wirklich dergleichen Auswüchse bestehen sollten, so kann man dem Verfasser nur dankbar sein, dass er die Aufmerksamkeit aller Gebildeten auf eine solche Verirrung lenkt, die den allerschärfsten Tadel verdient. Was von solchen akademischen Lehrern für junge Aerzte gross gezogen wer den, zeigt der Verfasser in der Person des Dr. Wöllner, der seiner Zeit als erster Assistent unter dem Professor Morgenstern gearbeitet hat, nun aber sich als praktischer Arzt in einem kleinen Städtchen niedergelassen. Er wird zu einem Manne gerufen, dem das Bein zerschmettert ist. Ehe er jedoch die Behandlung übernimmt, lässt er durch einen Boten bei dem Arbeitgeber des Verunglückten anfragen, ob er die Kurkosten für den Armen bezahlen werde. Als ihm darauf per Telephon eine bejahende Antwort zu theil und der Verunglückte seiner besonderen Sorgfalt empfohlen wird, da bricht diese ekelerregende Erscheinung, das Erziehungssubtrakt des Prof. Morgenstern, der ihm in seiner Praxis anscheinend vorleuchten soll, in die Worte aus, die jedem fühlenden Menschen die Schamröthe ins Gesicht treiben müssen: "Es ist doch ein Segen in diesen modernen Kulturerrungenschaften. Nun braucht der arme Kerl nicht noch eine Stunde in seinen Schmerzen dazuliegen." Wir fügen nur hinzu: Videant Consules!, dass das Volk nicht irre werde an den Universitäten als Pflegestätten der Wissenschaft im Dienste der Humanität.

Ernst Voss.

Handbuch der Mineralogie. Von Dr. C. Hintze, Professor an der Universität Breslau. Lief. 9—12. S. 1281—1842, mit 186 Abbildungen. Verlag von Veit & Co. in Leipzig.

A review of the first 8 fascicles of the second volume of this comprehensive work was already published in Vol. XII, No. 12 of the Pharm. Rundschau. At that time it was reported that the next, the 9th fascicle, would conclude this volume. The 4 fascicles now again on hand, which have appeared a short time ago and which are the closing ones of the same, show, however, that it was impossible to fulfill this promise, there being left many species to be described and in consequence a great amount of material. In these last fascicles we find treated the balance of the Silicates and Titanates, viz. Beryl, Leucit, Kieselzinkerz, Cerit, Pollux, Feldspathgruppe, Scapolithgruppe, Eudidymitgruppe, Petalit, Milarit, Eudialyt, Katapleit, Neptunit, Titanit, Guarinit, Tschewskinit, Perowskit, Knopit, Dysanalyt, Geikielith, Zeolith and wasserhaltige Silicate. A complete index of the described species closes this, the second volume.

All that has been said in the former review in regard to the completeness of this work should be repeated here, as the last fascicles reach the same high point, which the previous ones did. An idea of the extensive scope of this work may be got if we find, for instance, under Kalifeldspath (the description of which embraces 85 pages) the results of 329 analyses and under Natrolith those of 81.

Like the former ones these fascicles again prove the great diligence and care as also the thoroughness of the author, not less, however, the painstaking of the publisher in regard to the fine execution of the work. It is certain, therefore, without doubt, that the first volume now appearing will stand in the same high rank as its predecessor.

To all mineralogists, particularly to those possessing already the volume now finished, there will, consequently, be left but one desire, viz. that the next volume may soon be in their hands, if possible in a shorter time than the preceding one.

Edo Ciaassen.

Koehler's Neueste und wichtigste Medicinal-Pflanzen in naturgetreuen Abbildungen mit kurz erklärendem Texte. Ergänzungsband zu dem in den Jahren 1883 bis 1890 erschienenen Hauptwerke. Herausgegeben von Dr. Max Vogtherr. Druck und Verleger Fr. Eugen Koehler, Gera-Untermhaus. Lieferungen VIII—XI.

Numbers VIII to XI of this valuable work merit the same high praise that has been bestowed on the earlier parts. The quality of the plates, from the standpoint of their artistic merit as well as from that of their value as a means of instruction, is high.

The plates included in the numbers at hand illustrate the following plants: *Sinabis alba* L., *Cicuta virosa* L., *Duboisia myoporoides* R. Br., *Chrysanthemum inodorum* L., *Aspidiosperma Quebracho* Schlecht., *Chrysanthemum Parthenium* Pers., *Landolphia comorensis* (Boy.) K. Sch. var. *florida* (Benth.) K. Sch., *Chrysanthemum cineriaefolium* Benth. & Hook., *Anthriscus silvestris* Hoffm., *Conyza squarosa* L., *Andonis cirnalis* L. *and* *Castilloa elastica* Cew.

The text represents a concise summary of our knowledge concerning the plants discussed and their products. Many points of special interest might be referred to, but a single reference will suffice. The synopsis of the Eucalypts included in the discussion of *Eucalyptus globulus* Labil. gives the reader who lacks the large works on this important genus by Bentley, Müller, Maiden and others, a valuable summary of characteristics.

In these days when the future of the rubber supply is much under consideration, the diligent search for new resources has been rewarded by the discovery of several plants not formerly regarded in this connection. Hence the attention paid to rubber-producing plants here seems likely to be favorably received.

In case a reading knowledge of the German text is lacking, the plates alone are still worth the subscription price to any one wishing high-class illustrations. *Rodney H. True.*

Chemie und Physiologie des Malzes und des Bieres. Von Dr. Eugen Prior, Vorstand der vom Kgl. Bayer. Staate subv. Versuchsstation für Bierbrauerei zu Nuernberg. Ein Bd., pp. x, 597, nebst Tabellen. Verlag von Johann Ambrosius Barth in Leipzig. 1896. Brosch. M. 11.00; geb. M. 12.00.

In Feb. 1894 the German Imperial Council approved of the examination of a class of chemists to be known as Nahrungsmittel-Chemiker. It was rightly supposed that the chemistry of foods and beverages would thereafter receive more attention on the part of students of chemistry as well as on the part of specialists. Under the general direction of Drs. Geissler (Dresden), Hanausek (Vienna), Medicus (Wuerzburg), Thiel (Darmstadt), and with the aid of a number of specialists the above mentioned publishers began a series known as the Bibliothek für Nahrungsmittel-Chemiker. The volume before us constitutes volume five of this library. The volumes already published are:—

Bd. 1. Die Nahrungsmittel-Gesetzgebung im deutschen Reiche und in den einzelnen Bundesstaaten von Dr. Arthur Wuerzburg.

Bd. 2. Kurzes Lehrbuch der Nahrungsmittel-Chemie von Dr. H. Roettger.

Bd. 3. Instrumente und Apparate zur Nahrungsmittel-Untersuchung von Dr. Mayrhofer.

Bd. 4. Originalarbeiten über Analyse der Nahrungsmittel, zusammengestellt und mit Anmerkungen versehen von Dr. Julius Ephraim.

It will be seen from the above list that the series is more or less disconnected and that each volume, a monograph on its respective subject, is a unit by itself. Yet all have bearing on the same general subject of the analysis of food stuffs and beverages.

This series is to supply the student with the essentials of that branch of analytical chemistry which he must specialize if he intends to become a food chemist. In the hands of the examined chemist it will prove a valuable reference library and enable him to penetrate more deeply into those subjects in which he is particularly interested.

Although the volumes are more or less disconnected as to subjects it becomes readily apparent from the above list that the subjects of volumes one, two and three are quite general in character, that that of volume four is less so, and that the volume under consideration takes up the subjects of a single industry.

With the exeption of the work of Moritz and Morris published in England and translated into the German by Windisch there appears to be no larger monograph on the subject of malt and beer which does not go into technical details of the subject of brewing. The volume before us is excellently planned. It does not impart analytical information simply according to the rule of thumb. The chemistry of the malt producing materials e. g. is first taken up in considerable detail, the chemical changes brought about in the process of malting are discussed and finally the various methods of analysis are presented. Thus a scientific foundation is laid for an intelligent understanding of the analytical processes and of the results obtained. This is not only generally desireable but absolutely essential, e. g. in cases where expert testimony is to be given. The entire series can not be recommended too highly to chemists interested in the subject of food stuffs and beverages. *E. K.*

Sur le Dosage de la Caféine. Thèse pour l'obtention du diplôme de Pharmacien de 1re classe. Par Eugène Tassily, Etudiant de l'École Supérieure de Pharmacie de Paris. Société D'Editions Scientifiques.

The author has divided his work into two parts, the first being historical and including descriptions of previously proposed processes of extraction and estimation of caffeine in plants, while the second contains the results of his own experimental work. This latter is taken up with a critical study of the various processes in use for the estimation of caffeine; with the determination of various properties of this alkaloid, as solubility, effect of heat, of alkalies and acids, etc.; and lastly, a process of estimating caffeine in coffee, proposed by the author on the basis of these results. The bibliographical index which completes the pamphlet will be very valuable to anybody intending to do work along this line.

Richard Fischer.

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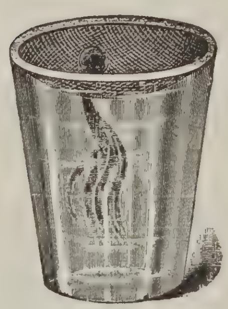

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(Formerly **Pharmaceutische Rundschau.**)

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EDITORIAL.

It is well known on this side of the Atlantic that Europeans are only too apt to give more attention to American idiocyncracies than to matters of real import and genuine worth. It must, therefore, have been all the more gratifying to the U. S. P. Revision Committee to learn how favorably its activity since the publication of the last edition of the Pharmacopœia has been commented upon by the pharmaceutical press of various European countries.

It is quite generally known that at the beginning of each decade a committee is elected by the General Convention for the purpose of revising the old and the publishing of a new edition of the U. S. Pharmacopœia. It is possibly less generally known that, under the able chairmanship of Dr. Rice, this committee has not been idle since the first copy of the seventh edition was introduced to the pharmaceutical public at the World's Fair meeting of the American Pharmaceutical Association in 1893.

Several months ago copies of a Digest of criticism on the United States Pharmacopœia, seventh decennial revision (1890), published by the Committee of Revision and Publication of the Pharmacopœia of the United States of America (1890 to 1900), were sent to all incorporated medical and pharmaceutical associations, colleges, etc., which were represented by delegates at the Seventh Decennial Convention for revising the Pharmacopœia held at Washington in 1890, and to others interested directly in the improvement of our national medical and pharmaceutical code. The volume of 183 pages which was distributed constitutes Part I and comprises abstracts of papers up to July 1, 1896.

It was for this manifestation of activity that the "practical" American received favorable mention on the part of his European colleagues. Compared with most other countries, the pharmacists of the United States have through their Committee demonstrated a very commendable activity. It now remains for the recepients of the Digest to make good use of the book and not to relegate it to disuse after probably having acknowledged its receipt with a few flattering remarks.

Without wishing to imply anything derogatory, it may not be improper to suggest a division of labor in the compilation of the Digest for the future. It is generally conceded that the various branches of pharmaceutical science cannot be mastered by a single person. If the Digest were to be merely a catalogue of titles, the principal accomplishment of the compiler should lie in the direction of linguistic attainments. As soon, however, as the contents of innumerable papers on subjects of pharmacopœial interest are to be interpreted and to be boiled down to a sentence or two, something more than mere linguistic attainments and a general scientific education become a necessity in order to accomplish the best results. Here the specialist may with propriety be requested to render service.

The Revision Committee is divided into numerous subcommittees. May not the members of these subcommittees be called upon to render service other than read circulars sent out by the chairman and vote aye or nay? In looking over the list of circulars it would appear that with few notable exceptions the work since the publication of the last Pharmacopœia has been done principally by persons not members of the Revision Committee. It has even been hinted several years ago that, while the revision was in progress, certain members considered their membership principally as an ornament.

Although the Digest is a compilation of considerable value and represents a line of activity not to be underestimated, it may not be amiss to point out at this time that the U. S. P. Revision Committee, under the leadership of its Chairman, about two years ago inaugurated an activity the importance of which can as yet be scarcely realized.

The new Pharmacopœia had hardly been published when the late Dr. Curtman reported the results of investigations that were in progress while the Pharmacopœia was being printed. The names of three or four other members also appear as contributors on the list of circulars.

Of the voluntary activity of such men the Committee can always rest assured. There are also others who have gladly offered their services gratuitously when occasion offered. About a year after the organization of the Research Committees in 1894, the Committee began to secure the assistance of young and promising scholars who could otherwise not have been of any service to the Revision Committee, and who, moreover, might have been lost to science. To interest them in pharmacopœial research, therefore, implied a double gain. The benefits of this system are not to be measured solely by the immediate results obtained, nor by the number of pages of reports submitted to the general committee.

There exists still another form of pharmacopœial revision activity in this country, of which possibly but few European pharmacists are aware. Not only does the American Pharmaceutical Association have a committee on the revision of the Pharmacopœia, but many state associations and other organizations possess similar committees. Some of these committees, or more correctly, certain members of such committees have from time to time displayed commendable activity and have submitted reports of no mean value. The committees have the great advantage of bringing the large body of practising pharmacists into direct sympathy with the work of revision.

A serious drawback, however, to most of these committees has been that they lacked permanency. After a competent person had made a commendable report, he has frequently been displaced by an incoming president, too ignorant often to know a good thing even when forced to see it.

So long as such committees lack permanency and are appointed annually without regard for the fitness of its members for the peculiar kind of work demanded of them, so long will their results fall short. Such work requires not only men with scientific ability and long experience, but men with an enthusiasm and a love for their calling. Their reports must not be made up at the last moment and consist of undigested suggestions obtained here or there at random, but should represent a solid year's work. Through these committees the pharmacists have a voice in the revision of their standard work. They may rest assured that, if they make intelligent use of this opportunity, their work will not remain unnoticed nor their suggestions unheeded.

The University of Michigan and the University of Wisconsin have each at their recent commencements graduated three men from the four years' courses. Although this number may seem insignificant to some, the fact is of no little import. It is five years ago that the University of Wisconsin offered a four years' course in pharmacy on the basis of other collegiate courses at the University. The course, however, could not be announced in the catalogue until the following year. Both in Ann Arbor and Madison there had been academic students who desired training in pharmaceutical studies; also pharmaceutical graduates who wanted a broader education than the two years' courses in pharmacy offered. Besides placing pharmacy on an equal basis with the other sciences and arts taught at these universities, it was expected that such a course would have a wholesome influence on the students in the shorter courses in calling their attention to the fact that there was more to pharmacy than could be learned in two years even at the best college or university. The student of pharmaceutical education had to be painfully conscious of the fact that some of the best students in pharmacy left their calling because it was too narrow to satisfy their mental aspirations. There had been a great deal of talk at pharmaceutical conventions about increasing requirements and adding to the courses existing, but no decided step was taken.

By some the course taken was considered bold, even suicidal; by others it was ridiculed and remarks about future 10 years' courses and the like were made in no complimentary vein. Yet after it had been demonstrated that students would enter such a course even before it could be announced in the catalogue and that there were other institutions to consider the matter favorably, the tenor of the remarks gradually changed. It is needless to state that such courses will never attract hundreds of students. Such indeed would prove a calamity rather than a blessing. On the other hand the fact that the University of Wisconsin has had seven graduates in five years and the University of Michigan a similar number in less time, is more than the most ardent advocates of this course dared to hope for five years ago.

Incidental to the development of the four years' course there has developed a three years' course. Students who wanted more than could be offered in two years, but for either lack of preparation or financial reasons could not enter the four years' course, made necessary a compromise course between the older two years' university course in pharmacy inaugurated by Michigan years ago and the new four years' course. The result has been that during the past year more than two-thirds of the students at the University of Wisconsin were taking courses longer than the two years' course.

This course, though not on as liberal a basis, yet allows of an arrangement of pharmaceutical studies analogous to that of the four years' course. This, even without the highly desirable choice of elections, is in itself a great gain.

To survey the advancements that have been made in pharmaceutical education during the past five years, is on the whole encouraging. In addition to the advancements made by state universities, the older colleges of pharmacy have not been idle. Their courses have been lengthened and strengthened. The former evening work is giving way more and more to day work. Laboratory courses, though short, are now obligatory in all departments of the better colleges. Longer courses are also offered though optional. Though drug-store experience before graduation still has its staunch advocates in the colleges, yet there is possibly not a single college of repute that does not offer a course for the graduation from which this experience is no longer required. Though the degree is a different one, yet these same colleges permit their graduates from these courses to secure drug-store experience and then to take the degree calling for such experience without further study or examination. Practice and theory evidently collide, but the practice will, no doubt, ultimately prevail.

But more significant than this unacknowledged victory of rational educational principles over old traditions is the fact that these colleges as well as the universities are more and more fostering the scientific spirit. To a small extent this is made apparent by the affiliation of independent colleges with broader institutions of learning, or by at least securing the semblance of such affiliation. To a greater extent this is inwardly manifested, though possibly less generally recognized, by the recruiting of the instructional force with young men who possess a thorough scientific education. The changes that have been made in this direction during the past few years speak volumes. Embued with an enthusiasm and a love for science for its own sake these teachers and investigators act as a leaven, the results of which are already visible.

On another page attention is called to the appointment, by the President of the American Pharmaceutical Association, of delegates and alternates to the International Pharmaceutical Congress to be held in Brussels. The Review in its former garb of Pharmaceutische Rundschau has repeatedly called attention to the character of such international conferences and to the meagre results attained. Only a few years ago such an international congress — international in name only — convnsed in Chicago in connection with the World's Fair. Although the conditions seemed extremely opportune, and although the American Pharmaceutical Association contributed liberally to make the affair a successful one, the conference proved an utter failure. That such a congress was ever held was soon forgotten. Certain Europeans even had the discourtesy to ignore it entirely. The only reason why certain members of the American Pharmaceutical Association have not forgotten the Congress entirely is to be sought in the strange fact that the proceedings of this would-be international affair have not yet been published.

On the one hand it might be argued that the American Pharmaceutical Association ought to have learned a lesson and should hereafter steer clear of all "tangling alliances" with further international congresses arranged by some society for its own aggrandizement. On the other hand it may be admitted that our national organization acted in the most charitable manner to itself and others by quietly appointing a committee to represent American pharmacy at Brussels. The mere appointment of such a committee will be favorably received by our Belgian confrères, whose undertaking has received extremely little favorable comment in Europe. In fact, several European societies have taken the trouble to publicly announce that they would not send delegates to a conference for which there absolutely appeared no *raison d'être*, while various journals maliciously pointed out the fiasco of previous congresses.

ORIGINAL CONTRIBUTIONS.

Algæ and Antiseptics.

By Prof. *Rodney H. True.*

The first comprehensive application within the writer's knowledge of the doctrine of electrolytic dissociation as an explanation of the action of dissolved chemical substances on living organisms, occurs in Schmiedeberg's[1] work on pharmacology. In this book, the doctrine is clearly stated and illustrative cases cited; no experimental proof being offered. The author seems to regard this explanation as that most satisfactorily accounting for the well known facts of therapeutics and physiology.

The first published results known to the writer, following investigations instituted with the stated object of determining how far the theory of the electrolytic dissociation of dilute, dissolved substances could be shown to explain the action of these substances on living organisms, constitute a paper by Kahlenberg and True.[2] In this paper the toxic action of electrolytes was studied with the roots of the white lupine, *Lupinus albus* L. In a subsequent article,[3] the authors discussed the theory and presented the evidence in greater detail. At the same time a paper by Heald[4] gave results obtained by repeating the same work with the roots of *Pisum sativum*, *Zea Mais* and *Cucurbita Pepo*.

Paul and Kroenig[5] followed the line of argument adopted in the above papers to explain the action of antiseptics on bacteria. Scheuerlen and Spiro[6] also apply this theory to the action of antiseptics on microbes.

In view of this chronology, the words of the reviewer of the article by Paul and Kroenig in the Pharmaceutische Centralhalle[7] of recent date are seen to be misleading when they say the article by these authors "um so mehr Beachtung verdient, als es der erste Versuch ist, die Gesetze des chemischen Reactionsverlaufes auch auf das lebende Protoplasma auszudehnen." Since Kahlenberg[8] has recently discussed the last two papers and incidentally, priority claims, more on this point is hardly necessary.

Another article by Kroenig and Paul[9] on the chemical basis on which our knowledge of the action of antiseptics rests, has recently appeared. The main body of results there incorporated is to be found in the article by the same authors cited above. They indicate a number of instances of early articles, in which the dissociation theory was invoked to explain phenomena. One article by Dreser[10] deals with a group of mercury compounds, the other[11] with anabic acid and a number of its compounds. These articles deal with but small groups of substances and are entirely inadequate as evidence on which to rest any general application of the modern theories of solutions to physiology. I still maintain that the first attempt to make a broad application of these views and substantiate it by a large body of systematically arranged evidence was made by Kahlenberg and True. If Paul and Kroenig have extended the laws of the chemical reaction to living protoplasm, it follows, then, that this has been done prior to their work by these authors.

Thus far, the conduct of seed-bearing plants and of the bacteria only has been taken into account.

During the past year, Mr. C. G. Hunkel and the writer have endeavored to ascertain how far this theory is appliable to the phenols. The questions of molecular structure and the toxic values of various radicles have also been borne in mind. The white lupine, *Lupinus albus* L., because it has been much studied and is very sensitive, has been used as a subject for experiment.

Wishing to operate with a plant of a type radically different from both the seed plant and the bacterium, the writer has made a series of experiments with the common Alga, the brook silk, *Spirogyra* sp. This plant possesses a number of advantages for this purpose. It is abundant and has been much studied. Its great delicacy of structure makes disarrangements of its cell contents easily discernable. The low grade of its organization compared with the seed plants makes it an object of rather generalized physiological properties and offers less liability to derangements than the highly specialized organisms.

Its extreme sensitiveness to the heavy metals was demonstrated by C. von Nägeli[12] who found that water distilled from a copper vessel was fatal to this plant because of the copper it contained. Copper salts were found to be deadly in inconceivable dilute solutions. One part of copper was found to make 100 million parts of water almost instantly fatal to this Alga. Silver, mercury, zinc, iron and other heavy metals proved to be injurious to a degree greater or less. This is far beyond the limit found by Kahlenberg and True[13] to be fatal to higher plants. Lupines first grew in the following solutions containing the heavy metal, as did probably the water in Nägeli's experiments also, as simple ions.

Substance.	Concent. of solution.	Proportion of metal to H_2O.
$AgNO_3$	1 grm. mol. in 409,600 litres	1:3,792,000
$CuCl_2$	1 " " " 51,200 "	1: 810,100
$FeSO_4$	1 " " " 25,600 "	1: 457,140
$CuSO_4$	1 " " " 25,600 "	1: 436,120
$HgCl_2$	1 " " " 25,600 "	1: 128,000

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[1] Schmiedeberg, O.: Grundriss der Arzneimittellehre. 3. Aufl. Leipzig, 1895.

[2] Kahlenberg and True: On the Toxic Action of Dissolved Salts and their Electrolytic Dissociation. Read at 47th Annual Meeting of Am. Med. Assoc., May 5—8, 1896. Journ. Am. Med Assoc., July 18, 1896.

[3] Kahlenberg and True: On the Toxic Action of Dissolved Salts and their Electrolytic Dissociation. Bot. Gaz. 22, p. 81.

[4] Heald: On the Toxic Effect of Dilute Solutions of Acids and Salts upon Plants. Bot. Gaz. 22, p. 124.

[5] Paul and Kroenig: Ueber das Verhalten der Bakterien zu chemischen Reagentien. Zeitsch. f. physik. Chemie XXI, p. 144.

[6] Scheuerlen and Spiro: Münch. Medicin. Wochenschr. 1897, No. 4.

[7] Pharm. Centralh. 38, No. 20, p. 313.

[8] Kahlenberg: The Relative Strength of Antiseptics. Pharm. Rev. 15, p. 68.

[9] Kroenig and Paul: Die chemischen Grundlagen der Lehre von der Giftwirkung und Desinfection. Zeitschr. f. Hygiene u. Infectionskrank. 25, p. 2, 1897.

[10] Dreser, H.: Zur Pharmakologie des Quecksilbers. Arch. f. Experim. Path. u. Pharm., Bd. 32, (1893).

[11] Ostwald, W.: Zeitschr. f. physik. Chemie 13, p. 77, (1894).

In a review of Dreser's article (see above) results found by Pfeffer in Locomotorische Richtungsbewegungen durch chemische Reize. Unters. a. d. bot. Inst. zu Tübingen, Bd. 7, 1884, also Ueber chemotactische Bewegungen von Bakterien, Flagellaten und Velvocineen, ibid. Bd. 2.

[12] Nägeli: Ueber Oligodynamische Erscheinungen in lebenden Zellen. Denkschr. d. Schweiz. naturforsch. Gesellsch. 33, 1, 1893.

[13] Kahlenberg and True: Bot. Gaz. 22, pp. 96—105.

Northwestern University School of Pharmacy, Chicago

Although sensitive to the heavy metals in a degree far exceeding the lupines, *Spirogyra* seems to be considerably more tolerant toward acids. Lupine roots placed in various concentrations of hydrochloric acid died in all dilutions stronger than 1 grm. mol. in 6400 litres. A long list of acids was tested and in all mono-basic acids dissociating completely, this same limit was found. This limit may be regarded as the toxic value of one acid hydrogen in completely dissociated solutions for lupines and may be briefly expressed as a ratio 1/6400. In accord with this, strongest solutions of di-basic acids undergoing complete dissociation that allowed growth, was 1 grm. mol. of the acid in 12,800 litres.

For *Spirogyra*, the first concentration in which a majority of the filaments lived after exposure for 24 hours to a completely dissociated mono-basic acid, HCl, was 1 grm. mol. of the acid to 800 litres, four times the concentration found for lupines.

The first concentration of sulphuric acid in which a majority of the filaments were found to live was 1 grm. mol. in 1600 litres. From these results, the toxic value of one acid hydrogen in completely dissociated acids for *Spirogyra* may be expressed as before by a ratio 1/800. It appears that in dilute solutions of acids, for *Spirogyra* as well as for the lupine, the number of hydrogen ions present is a measure of the toxic action of these solutions.

The toxic action of solutions of various phenols on roots of lupines was found to be much weaker than that of the above mentioned substances. Phenol, $C_6H_5(OH)$, first failed to kill the radicles in a concentration of 1 grm. mol. in 400 litres. The introduction of more (OH) groups as in resorcinol, $C_6H_4(OH)_2$, lessened somewhat the toxic action of the fresh solution toward the lupines.

Spirogyra seems to be less sensitive toward phenols as a rule than are lupine roots. The first concentration of phenol in which a majority of *Spirogyra* filaments were found to live after 24 hours exposure was 1 grm. mol. in 200 litres. The effect of the presence of two (OH) groups was not accurately determined. Hydroquinone, $C_6H_4(OH)_2(p)$, has been studied thus far more than its isomers. It changed its appearance and physiological properties in dilute solutions to such a degree and with such speed that the action of the unchanged hydroquinone was not ascertained with certainty. It seems, however, that before changes of color set in, it is not much more poisonous than phenol. Since the solution was found to become more poisonous toward *Spirogyra* as its color deepened, either one of two things seemed likely. Either some nascent action took place during the breaking down of the hydroquinone or some more fatal substance was produced. In order to render the breaking down complete, in the hope of obtaining a stable solution, a flask containing about 750 cc. of a solution of 1 grm. mol. in 50 litres of water was placed in strong sunlight with loosed stopper for several days. The action of the resulting substance on *Spirogyra* was then studied with rather surprising results. It was found to be fatal to Algæ in a concentration of 1 grm. mol. of the original hydroquinone in 25,600 litres. Since its previous exposure to light and air had diminished the probability of subsequent nascent action, it seemed that the hydroquinone had been broken down into some exceedingly vicious product. Thinking that some error might have crept in, the experiment was repeated with similar results. This very poisonous solution was of the color of strong coffee, and was neutral to litmus paper. When a concentration of 1 grm. mol. of hydroquinone to 50 litres was taken into the mouth, no taste could be with certainty detected, and no irritation was noted. Considering that the toxic action of phenol, one of the standard antiseptics, is some hundred-, yes, thousand-times stronger than the concentration of this product fatal to *Spirogyra*, it seemed well to test its action toward bacteria. At the suggestion of the writer, Mr. Robert Gay, a student of the University of Wisconsin, made a series of cultures of *Staphylococcus pyogenes aureus*, the pus-forming germ of wounds. Vegetating germs were exposed to solutions varying in strength from 1 grm. mol. in 50 to 1500 litres for periods of time varying from 15 to 45 minutes. An exposure of 15 minutes proved harmful to the germ as the dilution became greater, in the weakest solution but one-fifth of the number of colonies found on the control plates being found. An exposure for 30 or for 45 minutes proved very fatal, in no dilution after this exposure did more than two colonies appear. The antiseptic action of this product seems, therefore, beyond doubt.

Mr. W. D. Frost, assistent in bacteriology at the University of Wisconsin, is now giving this substance a more thorough study from the standpoint of the bacteriologist.

Pyrocatechin, $C_6H_4(OH)_2(o)$, seems to have to some degree a similar property, to what extent is not yet determined.

With the thought that perhaps even the more stable phenols might under the treatment given above to hydroquinone also undergo a similar change, a solution of phenol, 1 grm. mol. in 50 litres, was likewise exposed and then tested in regard to its action on *Spirogyra*. No change in its toxic strength was observed.

The introduction of various groups was found to influence the poisonous action quite materially in instances. The presence of a (COOH) group, as in salicylic acid $C_6H_4(OH)(COOH)$ is an example. The boundary concentration determined in the manner described above for *Spirogyra* lay near 1 grm. mol. in 1000 litres. When the acid hydrogen was replaced by a (CH_3) group, methyl salicylate, the toxicity was distinctly lessened, *Spirogyra* first surviving in 1 grm. mol. in 600 litres. Whether this represents the action of methyl salicylate or of some product or products from it, I cannot say.

When one oxy-methyl group (OCH_3) is present instead of an (OH) group as in anisol, $C_6H_5OCH_3$, or guaiacol, $C_6H_4(OH)(OCH_3)$, the toxic action seems to be little affected.

To what extent electrolytic dissociation plays a rôle in determining the toxic properties of the phenols, I will not undertake to discuss, it being, however, probably in a far less degree than in the inorganic acids and salts.

From what has been said, the preliminary nature of the results above given may be inferred. It is hoped to continue as soon as may be work along these lines and at some later day attempt to answer more satisfactorily questions now merely touched upon or hinted at.

Pharmacognostical Laboratory,
University of Wisconsin.

Medicinal Plants of Brazil.*

By *Dr. Theodor Peckolt of Rio de Janeiro.*

Nectandra cymbarum Nees. Diese Species kommt in den Staaten Pará und Amazonas vor und heisst daselbst *Paó de sassafraz, Sassafraz do Noste, Sassafraz de Pará.*

Es ist ein Baum von 20 bis 30 Meter Höhe mit hübscher, dichtbelaubter Krone. Die Blätter sind langgestreckt-länglich und lancettlich, oberseits glänzend dunkelgrün, unterseits bräunlich. Die Blüthen sind unbekannt. Die Beere ist oval, 55 mm. hoch, fast bis zur Hälfte vom Becher umschlossen.

In den kalten Monaten Juni bis August wird durch Einschnitte in die Rinde ein flüchtiges Oel gewonnen, welches in Pará als *Oleo de sassafraz* verkauft wird. Dasselbe ist gelb, dünnflüssig, von brennendem Geschmack und stark aromatischem Geruch, ähnlich dem einer Mischung von Kampher und Lorbeer. Es wird in der Dosis von 2 bis 4 Tropfen als kräftig krampfstillendes Mittel, sowie als Einreibung bei Rheumatismus medizinisch angewandt.

Die Rinde und Blätter wirken harn- und schweisstreibend. Die Rinde ist graubraun, mit kleinen, hellergefärbten Wärzchen besetzt, von gewürzhaft bitterem Geschmack. Als blutreinigender Trank werden 30 grm. zu 300 grm. Colatur verwandt und dreimal täglich ein Kelchglas genommen. Als Tonicum dient eine mit Zuckerbranntwein bereitete Tinctur, und zwar zur jedesmaligen Mahlzeit ein Theelöffel voll. Das Decoct wird zu Bädern bei Rheumatismus und als Waschung bei Hautkrankheiten verwandt.

Dr. Cursino de Moura hat Versuche in Betreff des schweisstreibenden Effectes gemacht und fand, dass die Rinde am schnellsten eine mässige schweisstreibende Wirkung hervorbrachte. Dieselbe wirkt nicht so energisch wie *Pilocarpus, Ottonia* etc. doch hat dieselbe auch nicht die oft beobachteten nachtheiligen Folgen der letzteren. Die schweisstreibende Dosis war: Blätter 30 grm., Rinde 20 grm., Holz 35 grm.; jedes zu 250 grm. Colatur, alle 10 Minuten ein Kelchglas voll.

Die stark aromatisch riechende Wurzel dient als Roborans. Dieselbe soll noch reichlicher flüchtiges Oel liefern als der Stamm.

Die Indianer benutzen das flüchtige Oel als Andidot bei Schlangenbiss. Sie behaupten dass der Geruch desselben die Schlangen betäubt und sie dadurch zum Beissen unfähig macht. Die Waldbewohner reiben die unbedeckten Körpertheile mit dem Oele ein um sich vor den lästigen Mücken zu schützen und behaupten auch dass sich keine Schlange nähert.

Nectandra leucothyrsus Meissn. ist im Staate Rio de Janeiro unter den folgenden Namen bekannt: *Canella branca da vargem* — weisser Zimmt der Ebenen; *Annuiba do brejo* und *Canella branca do brejo* — weisser Sumpf-zimmt.

Ein dünnstämmiger, bis 15 Meter hoher Baum mit dunkelbraunen Aesten, und länglichen und lancettlich zugespitzten Blättern, welche oberseits glänzend dunkelgrün, unterseits matt gelbbräunlich sind. Die achselständige Rispe ist mit weissen,

Nectandra cymbarum Nees. This species is found in the states Pará and Amazonas and is there called *Paó de sassafraz, Sassafraz do Noste, Sassafraz de Pará.*

It is a tree of from 20 to 30 meters in height with a fine crown of dense foliage. The leaves are elongated-oblong and lanceolate, the upper surface shining dark-green, the under surface brownish. The flowers are unknown. The berry is oval, 55 mm. in length, surrounded by the cupule almost to the middle.

In the cold months from June to August, by means of incissions in the bark, a volatile oil is obtained which is sold in Pará as *Oleo de sassafraz.* This oil is yellow, thinly-fluid, has a burning taste and a strongly aromatic odor similar to that of a mixture of camphor and laurel. In doses of from 2 to 4 drops it is used medicinally as a powerful remedy for cramps and is rubbed on externally in cases of rheumatism.

The bark and leaves act as diuretics and sudorifics. The bark is grayish brown studded with small bright colored protuberances of an aromatic bitter taste. As a blood-purifying drink 30 grm. to 300 grm. of colature are used and a wineglassful taken three times a day. A tincture prepared with rum serves as a tonic and a teaspoonful is taken at each mealtime. The decoction is used as a bath in rheumatism and as a wash in skin-diseases.

Dr. Cursino de Moura has made experiments relative to the sudorific effect and found that the bark produced most speedily a moderate sudorific action. It does not act as energetically as *Pilocarpus, Ottonia* etc., but it also lacks the often noted disadvantageous effects of the latter. The sudorific dose was: leaves 30 grm., bark 20 grm., wood 35 grm., each in 250 grm. of colature, a wineglassful every ten minutes.

The strongly aromatic-smelling root is used as a tonic. It is said to furnish volatile oil still more richly than does the trunk.

The Indians use the volatile oil as an antidote for snakebite. They declare that the odor of it stupifies the snake and renders it incapable of biting. The forest-dwellers rub the uncovered parts of their bodies with the oil to protect themselves from the troublesome mosquitoes and they also declare that no snake will approach.

Nectandra leucothyrsus Meissn. is known in the state of Rio de Janeiro under the following names: *Canella branca da vargem*—white cinnamon of the plains—*Annuiba do brejo* and *Canella branca do brejo*—white swamp-cinnamon.

A tree of about 15 meters height, with slender trunk, dark brown branches, with oblong lanceolate-acuminate leaves, whose upper surface is shining dark green, the under surface dull yellowish brown. The axillary panicle is made up of white

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* Continued from p. 135. Translated for the Review by Dr. R. H. True, Asst. Prof. of Pharmacognosy at the University of Wisconsin.

wohlriechenden Blüthen besetzt. Die Beere ist oval von der Grösse einer kleinen Olive, bis zu ⅓ von der Cupula umgeben.

Die Rinde, reich an Gummi, ist ein vielbeliebtes Wundmittel. Von der Epidermis befreit wird dieselbe mit einem Messer fein geschabt und auf Leinen gestrichen. Dieselbe klebt sehr stark und ersetzt dem Volke das Heftpflaster. Das Holz mit bräunlichem Splint ist leicht und porös. Es wird zu Bauten fast nie benutzt da es vorzugsweise von Termiten beschädigt wird.

Vorzügliches Bauholz, auch zu Schiffsbauten, liefern folgende Arten: —

Nectandra polyphylla Nees. Diese kommt im Staate Amazonas vor und heisst daselbst *Canella de follia larga* und *Louro de follia larga*— breitblättriger Zimmt und Lorbeerbaum. Sehr dickstämmig und bis 35 Meter hoch.

Nectandra nitidula Nees, welche in den Nordstaaten bis südlich nach dem Staate Santa Catharina vorkommt, heisst *Canella amarella* — gelber Zimmt — und *Embuia amarella*. Ein dickstämmiger, kleiner Baum mit weissbräunlichem Holze, welches vorzugsweise zu Brettern benutzt wird. Sp. Gew. 0.744. Zu gleichen Bauzwecken dient im Staate Rio de Janeiro die Varietät *latifolia* Nees, welche dieselbe Volksbenennung wie *N. polyphylla* hat.

fragrant flowers. The berry is oval, the size of a small olive, one third surrounded by the cupule.

The bark, rich in gum, is a favorite vulnerary. Freed from the epidermis it is scraped fine with a knife and spread on linen. It adheres powerfully and answers among the natives for sticking-plaster. The wood with brownish alburnum is light and porous. It is almost never used for building, since it is especially liable to injury from white ants.

The following species furnish excellent building material, even for ship-building.

Nectandra polyphylla Nees. This occurs in the state Amazonas where it is called *Canella de follia larga* and *Lauro de follia larga*—broad-leaved cinnamon and laurel tree. Trunk very thick and about 35 meters high.

Nectandra nitidula Nees, which is found in the northern states and south as far as the state Santa Catharina, is called *Canella amarella*, yellow cinnamon—*Embuia amarella*. A small tree with a thick trunk of whitish brown wood, which is used preferably for lumber. Sp. Gr. 0.744. In the state Rio de Janeiro the variety *latifolia* Nees, which has received the same native designation as *N. polyphylla* serves similar building purposes.

MONTHLY REVIEW.

Annual Reports.

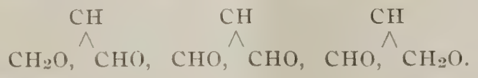
A Resume of Progress in the Chemistry of the Carbohydrates during 1896.*

By *W. E. Stone.*

Activity in this field has been unabated during the past year, and it becomes more and more evident to the student of the carbohydrates that these bodies present opportunities for the study and illustration of chemical theories in no way exceeded by their very great practical and technical importance. The following review is intended to include all of the publications appearing in the chemical journals during the year, although the practical impossibility of making the record complete is fully recognized. Purely technical papers have for obvious reasons not been included. The classification employed in former years has been retained.

General Reactions.—The continued study and development of new reactions among the carbohydrates has been so fruitful that these bodies may now be fairly regarded as among the most reactive of the general classes of carbon compounds. A large number of characteristic reactions have now been well studied, involving the general principles of polymerization, condensation, oxidation, reduction, ether, and ester formations, etc. Contrary to the former view that the carbohydrates were extremely unstable and sensitive compounds, it now appears that they are capable of undergoing the most manifold changes, not alone as regards their chemical features but in their physical properties as well. Indeed in this latter field it appears that the sugars offer the best known examples for the illustration of the principles of stereochemistry, while the latest researches indicate that sugar molecules are unstable systems in which a variety of intermolecular transformations may be induced. From their nature as derivatives of polyvalent alcohols containing several hydroxyls and, according to conditions, ketone, aldehyde or carboxyl groups, it is of course to be expected that great facility for reaction would follow.

Tollens and his pupils[1] have produced a series of condensation-products between polyvalent alcohols and formaldehyde, called *formals*. The reaction occurs readily when equal parts of the alcohol, a 40 per cent. solution of formaldehyde and hydrochloric acid of 1.19 sp. gr. are heated together. The products are crystalline and stable with the probable constitution—as illustrated by trimethylenemannite—



$$\mathrm{CH_2O},\ \overset{\overset{\mathrm{CH}}{\wedge}}{}\mathrm{CHO},\ \mathrm{CHO},\ \overset{\overset{\mathrm{CH}}{\wedge}}{}\mathrm{CHO},\ \mathrm{CHO},\ \overset{\overset{\mathrm{CH}}{\wedge}}{}\mathrm{CH_2O}.$$

Sorbite also yields a triformal; adonite a diformal with one free hydroxyl; erythrite and pentaërythrite diformals; glycerin a monoformal with a free hydroxyl, apparently in isomeric forms. Similar reaction follows with gluconic and saccharic acids.

A searching investigation upon the destructive action of more or less dilute mineral acids upon the monosaccharides, throws light upon many well-known reactions.[2] By heating dextrose, levulose, galactose, maltose, and arabinose with acids under different conditions of temperature, pressure, and time, and carefully estimating all of the decomposition-products, it was shown that the monosaccharides undergo three general phases of change which are largely independent of each other:

1. Condensation resulting in the formation of humus-like bodies.

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* Written for the Am. Chem. Journ.

[1] Tollens, Henneberg, and Schulz: Ann. Chem. Liebig), 289,20; also Ztschr. Ver. Rübenzuck., Ind., 1896, p. 274.

[2] Berthelot and André; Compt. rend., 123, pp. 567 & 625.

2. Formation of levulinic and formic acids, resulting from a splitting off of a terminal carbon atom, accompanied by deoxidation of the system including the five remaining carbon atoms; a part of this oxygen goes to produce the formic acid or, under changed conditions, carbon dioxide. With the pentose sugars the result is similar. Humus-like bodies are more readily formed where the action occurs under pressure or in closed vessels. The characteristic reaction of the pentoses to yield furfurol occurs readily and, as is well known, almost quantitatively. It is interesting to note that both pentoses and furfurol are endothermic compounds of almost identical degrees of heat-absorption, *viz.*,—86° and—88° calories respectively—which possibly explains the ready transition from one to the other.

3. The slow formation of carbon dioxide results in the case of the pentose as well as in that of the hexoses.

The reaction between monovalent mercaptans and aldoses,[3] and between polyvalent mercaptans and aldehydes,[4] has now been extended to polyvalent mercaptans and aldoses.[5] The condensation occurs on heating the reacting substances in the presence of concentrated hydrochloric acid; the products are crystalline and more stable toward acids and more soluble than those with monomercaptans. Such compounds have been prepared between dextrose, galactose, mannose, xylose, and arabinose and ethylene, trimethelene, and benzoyl mercaptans. The aldose and ketose sugars form characteristic compounds with hydrazine hydrate[6] on digesting small amounts of the substances in methyl alcohol and crystallizing from ether. The constitution is supposed to be as follows:

$$CH_2OH.(CHOH)_4.CH{=}N{-}N{=}CH.(CHOH)_4CH_2OH.$$

Such derivatives have been prepared from dextrose, fructose, and arabinose. Benzhydrazide also combines freely with aldose sugars in the presence of dilute alkalies.

Attempts have been made to utilize the properties of different hydrazines for the separation of sugars. Benzyl- and naphthylhydrazine afford compounds of dextrose and fructose, which by their different solubilities permit such a separation. Methylphenylhydrazine is adapted to the isolation of galactose. Melibiose forms an insoluble compound with allylphenylhydrazine, which may be decomposed by benzaldehyde so as to free the sugar[7]. In a second paper the authors give in detail the results of their comparisons of the properties of methyl-, ethyl-, amyl-, benzyl-, and β-naphthylhydrazines of the various monosaccharides with the exception of fructose, sorbose, and mannose which form no insoluble compounds with the above.

A mixture of galactose and arabinose combine with benzhydrazide, but the arabinose derivative is insoluble and may be separated from the golactose compound. Both may then be decomposed by bezaldehyde, leaving the respective sugars free.[8]

An effort to determine the relation between configuration and lactone-formation seems not to have led to conclusive results.[9] *l*-Gluconic, *l*-gulonic, *l*-mannonic, *l*-arabonic, and *d*-glucoheptonic acids were studied in comparison with their stereoisomers: the gluconic and arabonic acids showed little tendency to lactone-formation but the dibasic acids were particularly active.

The theory of multirotation has received no important contribution as might have been expected to follow the announcement of Lobry de Bruyn and his associates in 1895 regarding the intramolecular transformation and changes in the optical properties of sugars under the influence of alkalies.[10] The priority of the suggestion of this cause of multirotation is claimed by von Lippmann, as recorded in his work *Chemie der Zuckerarten*, p. 130.

It is pointed out that the supposed destruction and loss of sugar in factory-processes through the use of lead oxide or hydroxide is really due to a change in the rotary form of the sugar through the influence of the alkali.[11]

The decomposition of sugars heated with alkalies, and the appearance of brown color in such solutions is proportional to the temperature and concentration of alkali. If air is excluded no brown color results under a temperature of 45° nor is lactic acid produced, but if the solutions are boiled with free access of air the decomposition goes on more rapidly and lactic and formic acids result.[12]

New Synthetic Sugars.

Fischer has added two more to his long list of synthetic sugars by employing his already familiar methods. From xylose was obtained xylonic acid;[13] this by heating with pyridine becomes transformed into the new stereoisomeric lyxonic acid, which by reduction with sodium amalgam yielded lyxose, a new sugar belonging to the dulcite series. The author predicts its preparation by Wohl's "Abbau" method from galactose. In a similar way rhamnose was transformed through the stages of rhamnonic acid and isorhamnonic acid to isorhamnose, a methylpentose stereoisomeric with rhamnose.[14]

Monosaccharides.

Pentoses.—The qualitative reaction of the pentoses and pentosans with phloroglucin has been carefully studied.[15] On warming these substances with concentrated hydrochloric acid and phloroglucin a red color is produced which, with transmitted light, gives characteristic spectrum absorption-bands. The color separates as a sediment which may be filtered out and redissolved in alcohol, rendering the reaction much more sensitive. Other sugars give a colored solution, but no absorption-bands.

The separation of arabinose from galactose by means of the benzhydrazide reaction has already been referred to under "general reactions." Arabinose forms a compound with bromal similar to those with chloral.[16]

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[3] Fischer: Ber. d. chem. Ges., 27, p. 674.

[4] Fasbender: *Ibid*, 20, p. 460.

[5] W. T. Lawrence: *Ibid*, 29, p. 547.

[6] E. Davidis: *Ibid* 29, p. 2308.

[7] W. van Ekenstein and C. A. Lobry de Bruyn: Recueil trav. chim., 15, pp. 97 & 225.

[8] E. Subasschow: Ztschr. Ver. Rübenzuck-Ind., 1886, p. 270.

[9] E. Hjelt: Ber. d chem. Ges., 29, p. 1867.

[10] *Ibid*, 20, p. 3078.

[11] C. Lobry de Bruyn and W. van Ekenstein: Recueil trav. chim., 15, p. 92.

[12] F. Framm: Pflügers Archiv., 64, p. 575.

[13] E. Fischer and O. Bromberg: Ber. d. chem. Ges., 29, p. 581

[14] E. Fischer and H. Herboru: *Ibid*, 29, p. 1961.

[15] B. Tollens: *Ibid*, 29, p. 1202

[16] Hanriot: Compt. Rend., 122, p. 1127.

Rhamnose seems to be to some extent assimilable in the digestive tract, experiments showing that by healthy persons eigth per cent., and by a diabetic patient sixteen per cent. of the amount administered, was excreted unchanged.[17]

By fractional crystallization different modifications of rhamnose (isodulcite) have been noted; *e. g.*, β-isodulcite $[(\alpha_D=10^\circ$ to $12^\circ]$ and γ-isodulcite $[(\alpha)_D^\circ=20^\circ]$.[18]

With reference to the formation of furfurol from pentoses and pentosans, Tollens has repeated former experiments with glucuronic acid and its derivatives.[10] By distilling the acid with hydrochloric acid of 1.06 sp. gr., from 15 to 17 per cent. of furfurol was obtained, or something less than the theoretical amount. The derivatives of the acid also yielded furfurol in large quantities.

Hexoses.—Dextrose compounds with polyvalent mercaptans, with hydrazine hydrate and alkyl hydrazines, have been referred to under "general reactions." Galactose has been prepared from a kind of gum occurring in wine.[20] Galactosamine[21] loses one-half of its ammonia when boiled with methyl alcohol, and the residue has the same composition as the "osamine" of mannose.[22] A compound between gallactose and choral has been obtained which still retains the power to reduce Fehling's solution, and gives a red color with orcin chloride.[23]

Molecular modifications of galactose with varying rotatory power are reported as resulting from fractional precipitation of the sugar by absolute alcohol in the presence of dilute alkalies; *e. g.*, β-galactose $[(\alpha)_D=81^\circ.6]$ and γ-galactose $[(\alpha)]_D=53^\circ)$. In watery solutions these forms revert to the normal galactose.[24] A crystalline substance has been extracted from the seed of the yellow lupine, which by hydrolysis yielded galactose, but it does not appear that it was a hexavalent alcohol, although named galactite.[25] Compounds of galactose with chloral and polyvalent mercaptans have been referred to elsewhere.

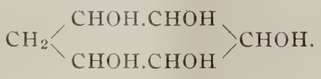
Mannose has been obtained in crystalline form from a solution in absolute methyl alcohol and ether. It melts at 132°, and exhibits multirotation from $(\alpha)_D=-13^\circ.6$ to $+\ 14.^\circ 25$.[26]

The two stereoisomeric methyl-mannosides,[27] on being mixed in molecular proportions, give an optically inactive mixture. On crystallizing at a temperature of 8° or lower, the two isomers crystallized separately, and by allowing the crystallization to proceed *in vacuo*, crystalls of unusual size were obtained, which could be mechanically separated. Crystallization above 15° yielded only the racemic compound. This would indicate that the racemic formation occurs under heat-absorption[28].

The occurrence of sorbose in fermented fruit juices is now accounted for by the isolation of a microbe which exerts an oxidizing influence on sorbite. Inoculation of this microbe into solutions containing sorbite, suffices to produce sorbose.[29]

Volemite, the heptavalent alcohol identified in 1895,[30] while evidently of carbohydrate nature, does not undergo hydrolysis with sulphuric acid, is non-fermentable, and does not react with phenyl hydrazine, although it combines with acetyl chloride, acetic aldehyde and benzaldehyde.[31]

The true position of quercite as a carbohydrate is still doubtful.[32] By oxidation with nitric acid it yields mucic and trihydroxyglutaric acids; with permanganate, malonic acid. The latter indicates the correctness of Kannonikow's formula,



$$CH_2\left\langle\begin{matrix}CHOH.CHOH\\CHOH.CHOH\end{matrix}\right\rangle CHOH.$$

Disaccharides.

Sucrose.—A very thorough study has been made by J. H. Long of the action of salts upon solutions of sucrose. The results of the investigation show that sucrose solutions are completely inverted by a large number of different salts. The action is slow at ordinary temperature, but increases rapidly above 60°; the action is also influenced by light. Apparently the inversion follows the general law governing the action of weak acids on sugars. Although all conditions of concentration, temperature, etc., were carefully controlled, the inversion coefficient was not constant for different salts.[33] Solutions of pure sucrose of 10 and 50 per cent. strength acted upon by sulphurous acid at temperatures from 30° to 80°, showed that inversion resulted in this case as well as with other acids in accordance with the Guldberg-Waage law. The same was found true in the presence of salts and other impurities.[34]

The electrical resistance of a solution of sucrose is a function of its concentration, the minimum being with a solution of a gram-molecule in something more than 10 liters of water. With a constant current the resistance is a function of the temperature, diminishing as t° increases. The current seems to produce only an inappreciable transport of sugar to the positive pole.[35]

A report on the use of Schollmeyer & Huber's electrolythic method for the purification of sugar solutions in factory operations, shows that the result is satisfactory, but that electrolysis alone cannot successfully compete with the lime process of clarification. The success of the present process is due to its combination with the lime process.[36]

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[17] L. Lindemann and R. May: Deutsch. Archiv f. klin. Med., 56, p. 283.

[18] Tanret: Compt. Rend., 122, p. 86.

[19] B. Tollens and F. Mann: Ann. Chem. (Liebig), 290, p. 155.

[20] G. Niviere and A. Hubert: Rev. inter. falsific., 9, p. 48.

[21] Ber. d. chem. Ges., 28, p. 3082.

[22] C. Lobrey de Bruyn and F. van Leent: Recueil. trav. chim., 15, p. 80.

[23] Hanriot: Compt. Rend., 122, p. 1127.

[24] C. Tanret: Bull. Soc. Chim. (Paris), [3], 15, p. 5.

[25] H. Ritthausen: Ber. d. chem. Ges., 29, p. 896.

[26] W. van Ekenstein: Recueil. trav. chim., 15, p. 221,

[27] Ber. d. chem. Ges., 28, p. 1145, 1167.

[28] E. Fischer and L. Beensch: Ber. d. chem. Ges., 29, p. 2927.

[29] G. Bertrand: Compt. Rend., 122, p. 900.

[30] Ber. d. chem. Ges., 28, p. 1973.

[31] E. Bourquelot: J. Pharm. Chim. [2], 26, p. 385.

[32] H. Kiliani and J. Schäfer: Ber. d. chem. Ges., 29, p. 1762.

[33] J. H. Long: J. Am. Chem. Soc., 18, p. 121, 693.

[34] K. Stiepel: Ztschr. Ver. Rübenzuck.-Ind., 1896, p. 654, 746.

[35] F. v. Siegroth: Elektro.-Chem, Zeit., 3, p. 33,

[36] Baudry: Ibid, July 5, 1896.

Chemistry.

β-Propyl-Piperidine.

This isomer of coniine has been prepared by J. D. Granger according to Gabriel's method by treating β-propyl-chloramylamine $(CH_2Cl)CH_2CH_2CH(C_3H_7)CH_2NH_2$ with potassa. The base is a colorless liquid which boils at 174° under a pressure of 758 mm. Its odor resembles that of coniine, but is not so strong and more like that of mustard oil.

Prof. Ehrlich has examined the base physiologically. He states that it is not as toxic as coniine, the corresponding α-compound, but that 12 ccm. of a 2 p. c. solution in the form of hydrochloride, viz. 0.25 g. $C_8H_{17}N$, will kill a rabbit weighing 1600 g. in three quarters of an hour. [Berichte 30, p. 1060.]

Alcoholic Fermentation without Yeast Cells.

Eduard Buchner has recently strengthened the position taken by his brother Hans (see pp. 94 and 138 of this journal) by additional experiments along the same line. He has brought what he considers a new proof for the existence of the zymase. Beer yeast was carefully freed from external moisture with the aid of the hydraulic press. It was air dried and then at 37°. One half was heated in a flask closed with a wad of cotton to a temperature of 100° for six hours. The yeast cells were thus killed as was proven by test cultures. Yet these dead yeast cells actively fermented a 37 p. c. saccharose solution within from 3—5 hours, the fermentation being caused by the zymase in the dead cells. The other half of the yeast which was heated to 140—145° for an hour no longer caused fermentation, indicating that at this more elevated temperature the zymase is also destroyed. As far as stability toward dry heat is concerned this therefore stands between the living plasm of the yeast and the invertin, which can still be extracted in its active condition after the yeast has been heated to 145° for an hour.

[Berichte, 30, p. 1110.]

Chinese Wax.

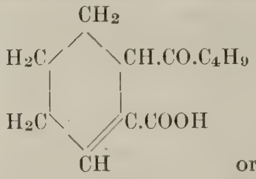
In connection with a detailed investigation of the process of cold saponification, R. Henriques has had occasion to examine two specimens of Chinese or insect wax. This wax is produced by the *Coccus ceriferus* Fabr., native in China and living on the Chinese ash, *Fraxinus chinensis*. Both specimens of wax were obtained directly from China. One specimen was radiating crystalline, could be easily comminuted and melted at about 81½°. The other specimen was more dense and granular crystalline. It could not be as readily comminuted and its melting point ranged up to 83°. Both were white like cetaceum. Besides esters of unsaturated alcohols both contain principally ceryl cerotinate, which was isolated from insect wax and examined by Brodie (Annalen, 67, p. 199). After four crystallizations from petroleum benzin (b. p. 114—135°) the ester is obtained pure.

The author reviews the older formulas assigned to acid, alcohol and ester and basing his conclusions on titrimetric results assigns to the respective substances the following formulas: $C_{26}H_{53}OH$, $C_{25}H_{51}COOH$ and $C_{26}H_{51}O_2 . C_{26}H_{53} = C_{52}H_{104}O_2$.

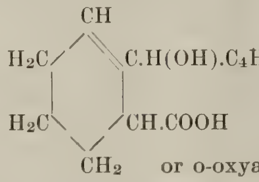
[Berichte, 30, p. 1415.]

Celery Oil.

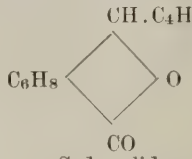
A report of the examination of this oil by Ciamician and Silber will be found on p. 140 of this journal. These chemists have more recently published a paper on the constitution of the odoriferous constituents of celery oil. To the sedanonic acid they assign the formula



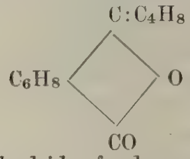
or o-valeryl-Δ^1-tetrahydrobenzoic acid. To sedanolic acid they give the formula



or o-oxyamyl-Δ^5-tetrahydrobenzoic acid. The odoriferous constituents are, as formerly stated, sedanolid and the anhydride of sedanonic acid, viz.:

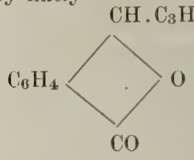


Sedanolid.



Anhydride of sedanonic acid.

Inasmuch as butylphtalide as well as its tetra- and hexa-hydro reduction products possesses a more or less celery-like odor, the authors reduced a derivative of a known phtalide, viz., phtalylisopropylidene. Its reduction product, very likely



also possesses an odor resembling that of celery.

[Berichte, 30, pp. 1419, 1424, 1427.]

Chelidonine.

The results of the late Arthur J. G. Tyrer have been reported by Prof. E. Schmidt. The material operated upon was obtained partly by E. Merck, and partly prepared from fresh chelidonium roots. In both cases the base crystallized from alcohol in transparent plates and melted at 135°. In its behavior to reagents the base corresponded with the accounts given by Henschke and Selle (Archiv f. Pharm. 1888 and 1890) and in composition was found to be the same as those authors state: $C_{20}H_{19}NO_5.H_2O$.

Of the salts, the hydrochloride, hydrobromide and phosphate were prepared and analyzed. From Henschke's account it might be inferred that chelidonine was a tertiary base, but at a temperature of from 130 to 140° a methyl derivative could be obtained.

The mono-acetyl- and mono-benzoyl-chelidonine were prepared, indicating that but one of the five oxygen atoms is present as hydroxy oxygen. With hydroxylamine a crystalline oxime of the formula $C_{20}H_{19}NO_4.NOH$ was obtained.

[Pharm. Journ. 1897 II, p. 21; from Apt. Ztg. 12, p. 442.]

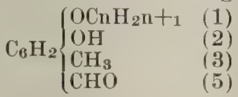
Coloration of Haloid Salts.

Under the influence of the cathode rays haloid salts of alkali metals acquire a more or less intense coloration, which was supposed by some to be the result of allotropic modification, and ascribed by others to a reduction of metal. By heating the crystals to redness in potassium or sodium vapor, Giesel had produced a similar result, and it appears that the color depends on the nature of the salt. Potassium bromide or iodide is colored clear blue, potassium chloride violet, and sodium chloride brown. The colors resist the action of air, but on dissolving the salts in water colorless solutions are obtained, as in the case of the natural blue rock salt. Salts colored in this way, as well as those colored by the cathode rays, lose their color when heated to a sufficiently high temperature.

[Berichte, 1897, p. 156.]

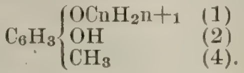
Homologues of Vanillin.

Homologues of vanillin of the general formula



$$C_6H_2\left\{\begin{array}{ll}OC_nH_{2n+1} & (1)\\ OH & (2)\\ CH_3 & (3)\\ CHO & (5)\end{array}\right.$$

result, according to a patent taken out by the chemical factory von Heyden, when chloroform in alkaline solution (Reimer-Tiemann's reaction) is allowed to act upon homopyrocatechuic ethers of the general formula



$$C_6H_3\left\{\begin{array}{ll}OC_nH_{2n+1} & (1)\\ OH & (2)\\ CH_3 & (4).\end{array}\right.$$

These homologues possess a persistent odor similar to that of vanillin, but distinct from it. They crystallize from hot alcohol in colorless or yellow scales or needles.

[Pharm. Centrh. 38, p. 441.]

Pumice stone as a Filter Medium.

For the filtration of liquids containing very fine precipitates which are apt to pass through the filter, such as baryum sulphate, lead sulphate, calcium oxalate etc., W. Busch recommends the use of powdered pumice stone. It is necessary to use a very finely powdered pumice stone which has been freed from acid soluble substances by boiling with dilute hydrochloric acid and washing with water. About 2 to 3 grams of this powder are placed in the bottom of a filter. After pouring back once a clear filtrate is obtained.

[Pharm. Centrh. 38, p. 424; from Neuest. Erfind. u. Erf.]

The Distribution of Alkaloids.*

Lobeliaceæ.

Lobeline, —, Lobelia inflata.

Loganiaceæ.

Strychnine, $C_{21}H_{22}N_2O_2$, Strychnos Nux vomica.
Brucine, $C_{23}H_{26}N_2O_4.4H_2O$, “ “ “
Curarine, $C_{18}H_{35}N$, Strychnos toxifera.
Tubocurarine, $C_{19}H_{21}NO_4$, “ “
Curine, $C_{18}H_{19}NO_3$, “ “
Akazgine, — Strychnos sp. (Akazga or Boundu or Icaja del Gabon.)
Spigeline, —, Spigelia marylandica.
Gelseminine, $C_{22}H_{26}N_2O_3$, Gelsemium sempervirens.

Meliaceæ.

Azadirine, —, Melia azadirachta.

Menispermaceæ.

Menispermine, $C_{18}H_{24}N_2O_2$ (?), Anamirta Cocculus.
Paramenispermine, —, “ “
Berberine, $C_{20}H_{17}NO_4$,, Cocculus palmatus.
Coclaurine, —, Cocculus laurifolius.
Pelosine (=Buxine?), $C_{18}H_{21}NO_3$ (?) .$1\frac{1}{2}H_2O$, Botryopsis platyphylla St. Hil. Cissampelos Pareira L.

Monimiaceæ.

Atherospermine, $C_{30}H_{40}N_2O_5$ (?), Atherosperum moschatum Labill.
Boldine, —, Peumus boldus (Boldoa chilensis).

Myrtaceæ.

Jambosine, $C_{10}H_{15}NO_3$ (?), Myrtus Jambosa.
Pelletierine (Punicine), $C_8H_{15}NO$, Punica Granatum.
Isopelletierine, $C_8H_{15}NO$, “ “
Methylpelletierine, $C_9H_{17}NO$, “ “
Pseudopelletierine (Granatonine), $C_9H_{15}NO.2H_2O$, Punica Granatum.

Nymphæaceæ.

Nupharine, $C_{18}H_{24}N_2O_2$ (?), Nuphar luteum (Nymphæa lutea).

Papaveraceæ.

Codamine, $C_{20}H_{25}NO_4$, Papaver somniferum (Opium).
Codeïne, $C_{18}H_{21}NO_3$, “ “
Gnoscopine, $C_{22}H_{23}NO_7$, “ “
Hydrocotarnine, $C_{12}H_{15}NO_3$, “ “
Kryptopine, $C_{21}H_{23}NO_5$, “ “
Lanthopine, $C_{23}H_{25}NO_4$, “ “
Laudanine, $C_{20}H_{25}NO_4$, “ “
Laudanosine, $C_{21}H_{27}NO_4$, “ “
Mekonidine, $C_{21}H_{23}NO_4$, “ “
Morphine, $C_{17}H_{19}NO_3$, “ “
Narceïne, $C_{23}H_{29}NO_9$, “ “
Narcotine, $C_{22}H_{23}NO_7$, “ “
Oxynarcotine, $C_{22}H_{23}NO_8$, “ “
Papaverine, $C_{21}H_{21}NO_4$, “ “
Papaverosine, —, “ “
Protopine, $C_{20}H_{19}NO_5$, “ “
Pseudomorphine, $C_{24}H_{38}N_2O_6.3H_2O$, “
Thebaïne, $C_{19}H_{21}NO_3$, “ “
Xanthaline, $C_{37}H_{36}N_2O_9$, “ “
Tritopine, $C_{42}H_{54}N_2O_7$, “ “
Rhœadine, $C_{21}H_{21}NO_6$, Papaver Rhœas.
Chelidonine, $C_{20}H_{19}NO_5.H_2O$, Chelidonium majus.
α-Homochelidonine, $C_{21}H_{21}NO_5$, “ “
β- “ $C_{21}H_{21}NO_5$, “ “
Chelerythrine, $C_{21}H_{17}NO_4$, “ “
Protopine, $C_{20}H_{17}NO_5$, “ “
Sanguinarine, $C_{20}H_{15}NO_4$, Sanguinaria canadensis.
β-Homochelidonine, $C_{21}H_{21}NO_5$, “ “
γ- “ $C_{21}H_{21}NO_5$, “ “
Glaucine, —, Glaucium luteum Scop.
Glaucopicrine, —, “ “ “
Fumarine, $C_{21}H_{19}NO_4$, Glaucium corniculatum.

Passifloriaceæ.

Carpaïne, $C_{14}H_{25}NO_2$, Carica Papaya.

Piperaceæ.

Piperine, $C_{17}H_{19}NO_3$, Piper nigrum.
Piperovatine, $C_{16}H_{21}NO_2$, Piper ovatum.

Polygalaceæ.

Ratanhine, $C_{10}H_{13}NO_3$ (?), Krameria triandra.

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* Continued from p. 140.

Ranunculaceæ.

Aconitine, $C_{33}H_{45}NO_{12}$, Aconitum Napellus.
Aconine, $C_{26}H_{43}NO_{11}$, " "
Pseudaconitine (= Napelline), $C_{36}H_{49}NO_{12}.H_2O$, Aconitum Napellus and A. ferox.
Picraconitine, $C_{31}H_{45}NO_{10}$, Aconitum Napellus.
Japaconitine, $C_{66}H_{38}N_2O_{21}$ (?), Aconitum japonicum.
Lycaconitine, $C_{27}H_{34}N_2O_6.2H_2O$ (?), Aconitum lycoctonum.
Myoctonine, $C_{27}H_{34}N_2O_6.5H_2O$ (?), Aconitum lycoctonum.
Delphinine, $C_{22}H_{35}NO_6$ (?), Delphinium Staphysagira.
Delphinoidine, $C_{42}H_{68}N_2O_7$ (?), " "
Delphisine, $C_{27}H_{46}N_2O_4$ (?), " "
Staphysagrine, $C_{22}H_{33}NO_5$ (?), " "
Calcatrippine, —, Delphinium consolida.
Hydrastine, $C_{21}H_{21}NO_6$, Hydrastis Canadensis.
Berberine, $C_{20}H_{17}NO_4$, " "
Canadine, $C_{21}H_{21}NO_4$, " "
Damascenine, $C_{10}H_{15}NO_3$, Nigella damascena.
—, —, Cimicifuga racemosa.
Isopyrine, —, Isopyrum thalictroides.
Pseudoisopyrine, —, " "

Rosaceæ.

Pyrarine, —, Pyrus s. Sorbus Aria.

Rubiaceæ.

Aricine, $C_{23}H_{26}N_2O_4$, Cinchona species.
Quinamine, $C_{19}H_{24}N_2O_2$, " "
Conquinamine, $C_{19}H_{24}N_2O_2$, " "
Quinine, $C_{20}H_{24}N_2O_2$, " "
Quinidine, $C_{20}H_{24}N_2O_2$, " "
Quinicine, $C_{20}H_{24}N_2O_2$, " "
Cincholine, —, " "
Cinchonine, $C_{19}H_{22}N_2O$, " "
Cinchonidine, $C_{19}H_{22}N_2O$, " "
Cinchotine, $C_{19}H_{22}N_2O$, " "
Cuscamine, —, " "
Cuscamidine, —, " "
Cusconine, $C_{23}H_{26}N_2O_4.2H_2O$, " "
Cusconidine, —, " "
Dicinchonine, $C_{38}H_{44}N_4O_2$, Cicosulenta (?) and Cinchona succiruba.
Diconquinine, $C_{40}H_{46}N_4O_3$, Cinchona succirubra.
Homocinchonidine, $C_{19}H_{22}N_2O$, Cinchona species.
Hydroquinine, $C_{20}H_{26}N_2O_2$, " "
Hydroquinidine, $C_{20}H_{26}N_2O_2$, " "
Hydrocinchonine, $C_{19}H_{24}N_2O$, " "
Hydrocinchonidine, $C_{19}H_{24}N_2O$, " "
Javanine, —, Cinch. Calisaya, var. javanica.
Paricine, $C_{16}H_{18}N_2O.2H_2O$, Cinch. succirubra (Darjeeling).
Aribine, $C_{23}H_{20}N_4.8H_2O$, Araribra rubra.
Chairamine, $C_{22}H_{26}N_2O_4$, Remijia Purdieana.
Conchairamine, $C_{22}H_{26}N_2O_4$, " "
Chairamidine, $C_{22}H_{26}N_2O_4$, " "
Conchairamidine, $C_{22}H_{26}N_2O_4$, " "
Concusconine, $C_{23}H_{26}N_2O_4$, " "
Cinchonamine, $C_{19}H_{24}N_2O$, " "
Cinchonine, $C_{19}H_{22}N_2O$, " "
Quinine, $C_{20}H_{24}N_2O_2$, Remijia pedunculata.
Cupreïne, $C_{19}H_{22}(OH)_2N_2$, " "
Coffeïne, $C_8H_{10}N_4O_2$, Coffea arabica.
Coffearine, —, " "
Crossopterine, —, Crossopteryx Kotschyana Fenzl.
Emetine, $C_{30}H_{40}N_2O_5$, Cephaëlis Ipecacuanha.
Cephaëline, —, " "
Erodine, $C_{12}H_{13}NO_{12}$ (?), Esenbeckia febrifuga Martius.
Esenbeckine, —, Exostemma floribundum.
Hymenodyctine, $C_{23}H_{40}N_2$, Hymenodyction excelsum Wall. (Cinchona excels. Roxb.)
Moradeïne, —, Cinchon. Morado Ruiz (=Cinch. purpurea R. & Pav.)
Palicourine, —, Palicouria Markgrafii.

Botany and Pharmacognosy.

Damiana Oil from Leaves.

Damiana leaves, originating from Mexico and said to be collected from various Turnera species (*Turnera diffusa* Ward, and *Turnera aphrodisiaca* Ward) were first distilled by us in 1888 (see Report, April 1888). A consignment of leaves distilled last year yielded 1 per cent of oil; this had the following properties:—sp. gr. 0.943, while the specific gravity of oils formerly distilled was much higher, amounting to 0.970 and 0.986; opt. rot.—23°25′; the oil contained saponifiable constituents, and we ascertained its saponification factor to be 41.8. When standing in a cool place, crystalline separations occurred on the surface similar to those initiating the solidification of oil of roses. It may, therefore, justly be deduced that damiana oil also contains paraffin. The oil has not yet found any practical application. The oil prepared by us has mainly served to complete scientific collections.

[Ber. Schimmel & Co., April '96.]

Lemon Oil.

Of considerable importance, particularly in legal controversies, is the question whether lemon oil contains or does not contain pinene. In order to get at the truth, we distilled 50 kilos of lemon oil employing a vacuum cooler. The first distillates—about 1 kilo—were subjected to repeated fractional distillations, aiming at the fraction passing over at the lowest temperature; this boiled at the temperature of 172°. Below this temperature, 8 cc., equal to 0.016 percent passed over, and this was wanting in all of the properties of pinene. Pure lemon oil, therefore, does not contain pinene; if so, it is adulterated with turpentine oil.

At former investigations, at a time when a discrimination between pure and sophisticated oil could not be ascertained, pinene had been found in lemon oil and was considered a constituent of the same. In conformity with the present state of knowledge, there can be no doubt that the oils then examined contained turpentine oil.

From recent investigations we obtained the evidence that the sophistication with turpentine oil is again much in vogue; we have met with commercial oils containing as much as 60 percent of turpentine oil.

[Ber. Schimmel & Co., April '96.]

Mandarin Oil.

On the basis of an investigation by de Luca (Comptes rendus 45, 904) published in 1857, the opinion has prevailed ever since that mandarin oil consists of one definite terpene, boiling at 178° and forming with muriatic acid a solid dichlorhydrate. When we established the presence of citral in this oil in 1891 (Report, April 1891, p. 67) and consequently proved that it contained oxygen, no solid derivative of this aldehyde had been obtained, since Doebner's reaction was discovered later on. We recently endeavored, with the aid of the compound formed at this reaction to verify our former statement; when boiling the respective fraction with β-naphtylamine and pyroracemic acid, the well-known yellow deposit was obtained; but upon repeated recrystallization, we did not succeed in obtaining a body of the constant melting point of citryl-β-naphtocinchonic acid. The product obtained commenced to melt at 197°, but did not become liquid before reaching the temperature of 222°. It is, therefore, probable that mandarin oil contains, like lemon oil, both aldehydes, citral and citronellal.

The properties of the hydrocarbon indicated the presence of limonene. After several fractionations, ⅝ of the oil finally reached the boiling point between 175° and 179°, showing an optical rotation of +77°. Part of this fraction was employed for obtaining the dichlorhydrate prepared already by de Luca, which was found to melt at 49°. Another portion was treated with bromine, yielding limonene tetrabromide melting at 104° to 105°. These reactions bear evidence that mandarin oil contains dextro-limonene.

[Ber. Schimmel & Co., April '96.]

Adulteration of Strophanthus Seeds.

It is reported that *Strophanthus* seeds are adulterated intentionally with the seeds of the Apocynaceous *Kickxia Africana*, a caoutchouc-producing plant of Africa. Dr. P. Siedler has studied comparatively the seeds of *Strophanthus hispidus* DC., *S. Kombé* Oliver and the seeds of *Kickxia*. The seeds of *Kickxia* are spindle-shaped, not flattened, and have base and apex tapered off in a similar manner. They are not hairy. The *Strophanthus* seeds, on the other hand, show at least their remains of hairs, are pronouncedly flattened in form, and have a rounded base and sharp apex. In cross section, the *Kickxia* seeds are characterized by much-folded cotyledons, while those of *Strophanthus* lie parallel upon one another. When treated with concentrated sulphuric acid, sections of *Kickxia* seed turn first brown, then cherry-red; the *Strophanthus* seed assumes a green color.

[Zeitschr. d. allg. oesterr. Apotheker-Vereins, 35, p. 398.]

The Water Hyacinth Pest.

The water hyacinth, *Piaropus crassipes* (Mart.) Britton, is a floating water plant bearing leaves which form a rosette from 1 to 2 feet high. The basal parts of the young plant are strongly swollen, these inflations acting as air reservoirs to buoy up the plant. The roots form a dense, bushy mass hanging down 2 feet or more. The plant is confined mostly to sluggish fresh water streams, ponds and the like.

It was first introduced into Florida from northern South America a considerable time since. Being by accident introduced in 1890 into the St. Johns River, its large masses of beautiful flowers gained for it favor, and a wider distribution was given it through the efforts of inhabitants of various river towns. In the last few years, however, the development of this plant in the rivers of Florida has been so rapid as to offer serious harm to several industries. The annual damage wrought by the floating masses to lumbering is estimated at $55,000. The fishing industry is greatly interfered with and bridges are threatened, while the decay of large masses threatens the health of communities. How to get rid of the pest is a problem now puzzling the government botanists.

[Bulletin 18, Div. of Botany, 1897.]

Bark of Prunus Virginiana.

Grace E. Cooley has studied the bark of *Prunus Virginiana* in view of ascertaining how far the official bark collected in the autumn may be distinguished from that collected at other seasons of the year. No distinctive histological distinction was found. It was observed, however, that a study of the starch grains in the bark gave much information. All barks collected in summer and winter are found to contain no starch or but very little. The maximum starch content is found in October and early November, just after the fall of the leaves. This gradually disappears, by the last of November the bark being nearly free from it, remaining so throughout the winter. Starch formation begins again in the spring, reaching its maximum about the end of April when the leaves are bursting the bud scales. Bark should, therefore, if collected in the fall, contain much starch. To distinguish fall bark from that collected in the spring, a test for tannin is applied. The amount of tannin in the spring bark is noticeably greater than in fall bark.

[Journ. of Pharmacol. 4, p. 168.]

Structure of Eucalyptus Leaves.

Dr. Albert Schneider has made an anatomical study of two types of Eucalyptus leaves. The earlier form is comparatively thin, rather large, ovate and cordate at the base. In cross section, palisade cells are found only on the upper side, stomata are found on under side only, about 40 to the sq. mm. The later type, the isolated leaf, is sickle-shaped, pointed, not cordate at the base. It takes a vertical position with the convex edge directed upward. Thickness of the earlier form, 167 to 208 μ, the later form, 334 to 501 μ. The epidermis of the isolated leaf is alike on both sides. It contains numerous stomata, 30 to 35 to the sq. mm., visible as whitish dots scattered over the surface of the leaf when examined with a lens. In cross section, the guard cells appear more sunken than in the dorsiventral type. The thickness of the outer wall of the epidermis, inclusive of cuticle and wax, is from 15 μ to 20 μ in the later form, in the earlier form 4 μ to 5.5 μ. The sickle-shaped leaf has a palisade tissue on each side, the spongy tissue being found only between these in the middle of the leaf.

[Journ. of Pharmacol. 4, p. 169.]

Official Jaborandis and their Adulterants.

Dr. Albert Schneider has given a detailed study to the various jaborandi leaves appearing in the market. Of the 26 species that may thus occur, but seven are given special attention. These are as follows: *Pilocarpus Jaborandi* Holmes, the Pernambuco jaborandi; *Pilocarpus Selloanus* Eng., Rio jaborandi; *Pilocarpus pennatifolius* Lem., Paraguay jaborandi; *Pilocarpus spicatus* St. Hil., Aracati jaborandi; *Pilocarpus trachyl-*

ophus (no author cited), Ceara jaborandi; *Pilocarpus microphyllus* Stapf., Maranham jaborandi: and *Swartzia decipiens* Holmes, false Maranham jaborandi.

All the leaflets studied have a single upper palisade layer, spongy parenchyma tissue and stomata in the lower epidermis only. The leaflets are entire, quite thick and firm and are similar in form though variable in size. All jaborandis studied have aggregate crystals in the leaf blades, the size and number varying with the species. No prismatic crystals were found. The oil glands occur with most frequency near the upper surface of the leaf; they are also numerous near the lower epidermis, rarely occurring wholly within the spongy tissue. They all belong to the lysigenetic class of glands, certain cells being broken down to furnish the contents of the glands. The hair-cells are in all cases simple, conical and more or less recurved.

Pilocarpus Jaborandi. Leaflets comparatively large, 8 to 12 cm. long, 2.5 to 4 cm. wide, average thickness 0.330 to 0.375 mm. Both upper and lower sides quite smooth with very few short hair-cells. Color when thoroughly dry quite brown, particularly on lower surface, odor faintly aromatic, taste slightly bitter and pungent. This species is recognized by the large size of the epidermal cells. Tangential diameter of cells of upper epidermis 45 to 55 μ, vertical diameter, 18 to 22 μ; lower epidermis, tangential diameter 48 to 60 μ. Epidermal cells without contents.

Pilocarpus Selloanus. Leaflets closely resemble preceding, somewhat broader and thinner, 3 to 5 cm. wide, 0.270 to 0.285 mm. thick; glands more readily visible, color less markedly brown than in foregoing species; taste decidedly more pungent, otherwise similar. Distinguished from *P. Jaborandi* by smaller epidermal cells and from succeeding species by absence of sphaerocrystals and other epidermal contents, by the absence of long, curved hairs and resin cells. Tangential diameter of cells of upper epidermis 27 to 32 μ, vertical diameter 12 to 15 μ.

Pilocarpus pennatifolius. Leaflets quite variable in size, 8 to 14 cm. in length, 2.5 to 5.5 cm. wide, thickness 0.180 to 0.210 mm. Glands quite numerous, but faintly visible to the naked eye, color as in *P. Selloanus*, odor much as in *P. jaborandi.* Distinguished by markedly reddish-brown, resinous substances found in various tissue elements; colored guard cells of stomata diagnostic.

Pilocarpus spicatus. Leaflets 5 to 6 cm. long, 2.5 to 3 cm. wide, average thickness 0.165 mm. When thoroughly dried, brown with a reddish tinge, scarcely any perceptible odor, taste pungent and only slightly bitter, glands numerous and comparatively small. Distinguished by epidermal cells (especially lower epidermis) fitted with sphaerocrystals and resinous substances. Sphaerocrystals not readily seen since enclosed by the resinous substance. Resinous substance (of spongy tissue in particular) reddish-brown as in *P. pennatifolius.*

Pilocarpus trachylophus. Leaflets 4 to 6 cm. long, 2 to 3 cm. wide, 0.300 to 0.345 mm. thick. Lower surface markedly pubescent, upper surface slightly so; color above olive-green, paler below. Odor faintly aromatic, taste slightly pungent, somewhat bitter. Distinguished by long palisade cells (95 μ) and numerous long, sickle-shaped hairs on the lower surface; similar hairs also occur on the upper surface, fewer in number and usually shorter.

Pilocarpus microphyllus. Leaflets small, 2.5 to 3 cm. long, 1.25 to 1.75 cm. wide, thickness 0.240 to 0.280 mm. Color bright olive-green, practically odorless and tasteless. Distinguished by yellowish granular contents of guard cells and auxilliary cell of stomata, also by dark olive, smoky color of contents of resin cells.

Swartzia decipiens. This is a member of the *Leguminosæ* and has none of the properties of true jaborandi. Leaflets resemble *P. microphyllus*, small, 2.5 to 3.5 cm. long, 1.5 to 2.25 cm. wide, 0.160 mm. thick, not pubescent; color dull green, oil glands, aromatic odor and pungent taste wanting. This particular false Maranham jaborandi is recognized by the wavy outlines of the vertical walls of the epidermal cells.

In order to insure success in identifying these leaves in powders, the material must be finely comminuted, Nos. 80 to 100 being best. Glycerine and water in equal parts or glycerine, water and alcohol are good mounting media and serve likewise to clear the mounts as well. Care should be taken to exclude air bubbles. Fifteen to twenty percent mixtures may be detected.

To facilitate the classification of specimens under study, the abstractor has arranged the following key based on the diagnostic points of Dr. Schneider's descriptions.

- Leaflets without punctate dots, internal oil glands, *Swartzia decipiens.*
- Leaflets with punctate dots, internal oil glands,
  - Leaflets 8 to 14 cm. long, 2.5 to 5.5 cm. wide,
    - Epidermal cells without contents,
      - Tangential diameter of upper epidermal cells, 45 to 55 μ, *Pilocarpus Jaborandi.*
      - Tangential diameter of upper epidermal cells, 27 to 32 μ, *Pilocarpus Selloanus.*
    - Epidermal cells containing sphaerocrystals, sometimes also reddish-brown resin, tangential diameter, 16 to 25 μ, *Pilocarpus pennatifolius.*
  - Leaflets 4 to 6 cm. long, 2 to 3 cm. wide,
    - Palisade cells short, 45 μ long, 15 μ wide, *Pilocarpus spicatus.*
    - Palisade cells long, 95 μ long, 9 to 11 μ wide, *Pilocarpus trachylophus.*
  - Leaflets 2,5 to 3 cm. long, 1.25 to 3 cm. wide, *Pilocarpus microphyllus.*

[Journ. of Pharmocology, 4, p. 141.]

Medicinal Plants of the Klamath Indians.

In a recent paper, Frederick V. Coville, government botanist, gives his observations on the plants used by the Klamath Indians, a tribe living in the southeastern part of the state of Oregon.

A glance at the list of plants used medicinally, reveals some interesting facts. Among the plants mentioned as having distinct uses as remedies, we find five emetics of various degrees of efficiency, two vesicants, one strong poison, one sudorific, one probable astringent, two protectives, one emollient, one pectoral, and one vulnerary. This list is interesting not merely because of what it contains, but perhaps fully as much so because of what does not appear.

The plants and their uses as noticed by Coville follow.

Libocedrus decurrens Torr. The branches and twigs of this Conifer are often used in administering a sweat-bath to a sick person.

Pinus murrayana Balf. The pitch of this tree is sometimes used as a remedy for sore eyes, a very small fragment being placed inside the lid.

Triglochin maritima L. furnishes seed-like carpels which are parched and eaten and sometimes roasted and used as a substitute for coffee.

Zygadenus venenosus Wats. A plant popularly, and doubtless correctly, supposed to poison cattle; well known locally under the name "poison camas", "white camas" and "lobelia" and common in the natural meadows. The roots when eaten cause extreme vomiting.

Iris missouriensis Nutt. The dried root stalks are sometimes used by medicine men as a smoking material, mixed with *Zygadenus venenosus* and a little tobacco, to give a person a severe nausea, in order to secure a heavy fee for making him well again.

Eriogonum stellatum Benth. A low shrub, the small, rounded, cottony leaves of which, about 2 ctm. in diameter, are placed on burns to soothe the pain by protecting the surface from the air.

Kunzia tridentata (Prush) Spreng. A shrub commonly 1 to 1.5 meters in height characteristic of the yellow pine forest. The roots after steeping in water are drunk as a remedy for coughs and other lung and bronchial troubles. The Indians regard this as their best medicine for this class of complaints. The dry, ripe fruits, which are intensely bitter, mashed in cold water and drunk are sometimes used as an emetic.

Rhamnus purshiana DC. In this part of Oregon the bark of this shrub, Cascara sagrada, is apparently not gathered for the market. The foliage, twigs and bark are made into a tea by the Indians and used as an emetic. The berries also act as an emetic.

Cicuta maculata L. One of the *Umbelliferæ* characteristic in swamps and along streams containing a deadly poison. The roots mashed and mixed with poison from a rattlesnake's poison sacs or with the decomposed liver of a deer or some other animal, which has been buried in the ground a few days, were used to poison war arrows, the heads of the arrows being dipped in the moist mixture and dried over a special kind of fire with a certain ceremonial. Cicuta was sometimes used among Indians to poison people in very much the same way as arsenic and other well-known poisons are used in civilized communities. It is also stated that pieces of dead fish dried in a certain manner are a deadly poison when taken in food. *Cicuta* roots are said to kill horses and cattle. In tramping in marshes where the plants abound, the animals crush the roots, and the poisoned water in the hoof holes is afterwards drunk or the exposed roots eaten.

Heracleum lanatum Michx. The young shoots when about 15 ctm. high are used for food and the roots are employed medicinally. [In what manner, is not stated.]

Apocynum cannabinum L. This plant seems not to be in use either for its fibre or as a medicine.

Mentha canadensis L. The native, true mint, frequent in the borders of marshes. A tea is made from its herbage.

Sambucus glauca Nutt. The common elder of this region. The berries are used as food. One curious use of the plant, now rarely resorted to, but formerly common among the Snake Indians, consists in punching out the pith from sections of the stem, ramming them full of large crickets, *Anabrus simplex* Hald., and plugging the ends. The contents of the stems were used for food in the winter.

Artemisia tridentata Nutt. The largest, most abundant and most widely distributed species of sage bush, composing probably nine-tenths of the shrubby plains vegetation of southeastern Oregon. In medicine, a decoction of the herbage is used internally to check diarrhœa, externally as an eyewash, while the mashed vegetation is used as a substitute for liniment.

Wyethia mollis May. Abundant in the yellow pine forests. The roots of a plant, which from the description is probably this, are mashed and used as a poultice for swellings.

Chondrophora nauseosa (Prush) Britton. A shrub of the plains about 4 feet high, silvery-white, with narrowly linear leaves, bearing yellow composite flowers in September. Its mashed herbage, aromatic and resinous, is used to raise blisters.

Chrysothamnus bloomeri (Gray) Greene. A yellow-flowered composite shrub, 1 to 3 feet high with slender, bright green foliage. A poultice of the mashed leaves and flowers is used to draw blisters. Related shrubs containing aromatic resinous principles are used in a similar manner.

[Contrib. from U. S. Nat. Herb., Vol. V, No. 2, 1897.]

Proteids of Seeds.

T. B. Osborne and G. F. Campbell find that both yellow and blue lupin seeds contain very little proteid matter soluble in water. The total quantity obtained from the yellow lupin amounted to 0.37 per cent. only, and of that part consisted of proteose. Peptone is not contained in the freshly-ground seed, but is formed in small quantity after prolonged contact with water. The proteid matter soluble in saline solutions was found to be conglutin, the yellow lupin yielding 26.2 per cent. Sunflower seeds yield a large quantity of a globulin, probably edestin, but as obtained by extraction from the seed it is mixed with helianthotannic acid. The chief proteid of the cow-pea (*Vigna catjang*) is also a globulin, essentially different in composition and properties from the legumin of the pea and vetch. The name proposed for it is "vignin." Besides this the cow-pea contains two other globulins, one resembling phaseolin. The white-podded adzuki bean (*Phaseolus radiatus*) contains phaseolin and a distinct globulin, which is being further investigated.

[Journ. Am. Chem. Soc., XIX., 454, et seq.]

Collecting Papaw Juice.

F. B. Kilmer recommends that an incision, not more than ⅛ inch deep, be made lengthways in the green and full fruit, and the juice collected in tin pans made so as to surround the trunk of the tree. The collection should take place early in the morning, as the sun quickly dries the juice and so stops the flow. The yield is much larger just after a rain storm or a spell of wet weather. The juice must be tried in the sun the day it is collected, after spreading out thin in the tin pans or on sheets of glass.

[Bull. Bot. Dept., Jamaica, IV., 68.]

New Remedies.

Dextroform.

This is a combination of formaldehyde with dextrine. It was first prepared by Prof. A. Claasen and employed as an antiseptic agent by Dr. Bongartz (Muench. Med. Wochenschrift, 1897, No. 22). This new remedy is freely soluble in water and glycerine, and was found to be especially useful in gonorrhœa. In general, it strongly resembles amyloform in its therapeutic properties. [Ph. Ztg., 1897, p. 404].

Kreosolid.

Under this name Dr. Denzel, of Tubingen, has introduced a magnesium compound of the divalent phenols of creosote: it is a white powder with slight smell and taste, has no caustic action, and can therefore be taken without discomfort. In the stomach guaiacol and creosol are liberated in a minute state of division by the acid there present. The dose is seven grains four times a day.

Therapeut. Monatsh., 1887, p. 292.]

Ossalin.

Ossalin (Adeps ossium) is a fat prepared from fresh beef-bone marrow by J. E. Stroschein of Berlin, and recommended by him as an ointment base. The main advantage of this fat, according to the author, is that it is capable of taking up as high as 200 p. c. of water, which property would lead one to suppose that any ointment prepared from ossalin should be quickly absorbed by the skin. Ossalin is a very mild fat, perfectly neutral, and not producing the least irritation of the skin. It has a grayish-white color and a tallow-like odor. [Ph. Ztg., 1897, p. 354].

Ossin.

This new remedy (called also Extractum ossium liquidum) is like the above placed on the market by J. E. Stroschein of Berlin. According to the manufacturer 100 parts of the preparation contain: water, 8.82 p.; salts, 9.40 p.; ethereal extract, 0.06 p.; nitrogen, 12.10 p.; substances soluble in alcohol of 80°, 61.25 p. The salts consist of phosphoric acid, 32.79 p. c.; sulphuric acid, 1.85 p. c.; chlorine, 9.54 p. c.; ferric oxide, 0.34 p. c.; sodium oxide, 12.12 p. c.; potassium oxide, 38.47 p.; lime and magnesia, 4.77 p. c.; silica, 0.03 p. c. The preparation appears on the market as a dark brown fluid of slightly bitter taste; it is intended to be used in the cure of diabetes.

[Ph. Ztg., 1897, p. 354.]

Alcarnose.

Alcarnose is a new food, prepared by J. D. Riedel of Berlin according to the formula of Dr. Hiller of Breslau; it is said to contain, in a predigested condition, all the nutritive elements necessary for the nutrition and strengthening of the body. According to the manufacturers, the preparation is so readily soluble that it can be directly absorbed and assimilated by the mucous membranes of the stomach and intestinal canal, and is therefore capable of affording nutrition to the system even in case of complete lack of digestive activity. Alcarnose forms a brown tough mass, of pleasant odor and taste. It can be borne even by a very delicate stomach, and can be taken for weeks without any ill effects. It comes on the market in capsules of 12 g. capacity; to prepare a bowl of soup, 2—3 of these are dissolved in hot water, bouillon, or milk. The percentage composition of alcarnose, according to Dr. Hiller, is as follows: Digested albumen (from meat and vegetables), 23.8 p.; extractive matter and salts from meat, 2.3 p.; digested carbohydrates (maltose and dextrine), 67.1 p.; salts (sodium chloride; alkaline phosphates, carbonates, sulphates, and organic salts; alkaline earths, traces of iron), 6.8 p.

[Ph. Ztg., 1897, p. 354.]

Dialysates.

Golaz, apothecary in Vevey, has introduced under this name a kind of dialyzed fluid extracts which contain in each part by weight the active constituents of an equal part by weight of the fresh plant.

The fresh plants are harvested during good weather, sorted and immediately reduced to a pulp and transferred to the dialyzer. It is first extracted with water, then with alcohol, a very weak spirit being used at first and the concentration gradually increased. The dialysis lasts about two weeks. The dialyzed product is then assayed. Dr. Kunz-Krause has shown that these dialyzed extracts really contain the active alkaloids or glucosides and Dr. Jacquet reports favorably on their stability.

[Pharm. Centrh. 38, p. 423; from Corresp.-Bl. f. Schw. Aerzte 1897, p. 326.]

Oxysepsine.

Under this name Prof. Hirschfelder (D. med. Wochenschr., 1897, 19) has brought out a substance resembling oxytuberculine (see above), concerning which he says:

"In advanced cases of tuberculosis with cavities, we have to deal with a complex infection of several micrococci and bacilli which produce the destruction of the tissues as well as the hectic fever. In such cases I have employed, besides oxytuberculine, an oxytoxine which is prepared in a similar manner from bacteria isolated from the sputum of a tuberculous person, suffering from a high hectic fever. Enormous quantities of both substances were injected, without causing any inconvenience. The equivalent of 2.5 g. of tuberculine, and as much as 60 ccs. of oxysepsin were often injected without producing any rise in temperature or the slightest other untoward effects."

[Ph. Ztg., 1897, p. 326.]

Oxytuberculine.

This is the name given by Prof. J. O. Hirschfelder (D. med. Wochenschr., 1897. 19) to a tuberculine modified by oxydation, which after numerous experiments he believes capable of curing local as well as general tuberculosis. For the preparation of this remedy he does not employ Koch's tuberculine, but one prepared by himself from a very virulent bacillus. According to the author, this bacillus by growth in the proper medium has become so virulent, that nine days after inoculation into guinea-pigs, general tuberculosis with numerous bacilli resulted. The culture-medium consists of calfs-bouillon with 4 p. c. glycerine, 1 p. c. Witte's peptone, 0.5 p. c. sodium chloride and 0.3 p. c. sodium carbonate. After the completed growth of the bacilli, this is sterilized and filtered. The filtrate is mixed with ⅛ its volume of 10 p. c. (by volume) hydrogen peroxide solution, the vessel closed with cotton and heated in a sterilizer. Every twelve hours a like quantity of hydrogen peroxide is added, and this continued for 16 hours. The excess of hydrogen peroxide is removed by rendering the solution alkaline. The advantage of this lymph over other tuberculine preparations is said to lie in the fact that comparatively large doses (20 ccs. daily) can be given without any bad after effects. Hirschfelder was led to this work by the consideration that the changes by which toxines are transformed into antitoxines in the organism are those of oxydation.

[Pharm. Ztg., 1897, p. 326.]

Triphenyl Albumin.

Prepared by heating dry powdered egg albumin with ten times its weight of phenol on a water bath and precipitation with alcohol. The flocculent precipitate is then washed with alcohol and water: it is free from taste or smell, insoluble in hot water, alcohol or potash solution, but readily soluble in phenol. According to Shimada it is albumin in which three hydrogen atoms—in Leberkuhn's formula—are replaced by phenyl groups, $C_{72}H_{109}(C_6H_5)_3N_{18}SO_{22}$. Triphenyl albumin is described as being a good material for the culture of bacteria, and it is susceptible of fermentation like ordinary albumin.

[Pharm. Journ., 59, p. 4; from Chem. Centralb., 1897, p. 18.]

Ichthalbin.

This new remedy, a combination of ichthyol with albumen, analogous to tannalbin, was first rcommended by Dr. A. Sack (D. Med. Wschr., 1897, No. 23) as a substitute for ichthyol in internal medication. It is said to produce the same results as ichthyol without showing any of the bad secondary effects (heartburn, nausea, etc.) of the latter.

Solutions of ichthyol with albumen solutions produce precipitates which still retain distinctly the odor and taste of pure ichthyol, but loose these upon heating for several hours, or by washing for some time with alcohol or with much water. There is thus obtained a very fine, grayish-brown powder, which is not only odorless but also almost tasteless. Experiments have shown that the preparation is insoluble in acid solutions (pepsin-hydrochloric acid), but is dissolved completely in alkaline solutions, from which it is precipitated as a voluminous precipitate upon acidulation. Ichthalbin is administered as a dry powder, 4 g. per os, this quantity corresponding to 3 g. of commercial ichthyol. The new remedy is put on the market by Knoll & Co., of Ludwigshafen a. Rh.

[Ph. Ztg., 1897, p. 404].

Iodized Fats.

These are iodine addition products of several fats, for whose preparation E. Merck has applied for a patent. According to Dr. Winternitz, who first prepared these compounds of constant composition, they may be employed therapeutically in place of potassium iodide and other iodine preparations. He found that upon feeding animals with iodized fats (together with other food) he could easily demonstrate the presence of iodine in almost all parts of the body. Not only did the abdominal fat contain it, but also the ethereal extracts of almost all organs, and especially the muscles and bones, contained large quantities of iodine. Muscles freed as thoroughly as possible from fat, still contained appreciable quantities of iodine. To be sure, the iodized fat after it becomes part of the organism does not retain its original composition, since it looses iodine during the process of absorption.

These new preparations which are said to differ in no respect from the original fats as regards odor and taste, are recommended by Winternitz for internal and external use in place of Ol. Jecoris iod., Ol. Iodi, Ungt. Iodi, and other unpalatable iodine preparations. Experiments with similar bromine preparations are now in progress.

[Ph. Ztg., 1897, p. 404.]

Literary.

Books and Pamphlets Received.

Verlag von Chr. Herm. Tauchnitz—Leipzig. Anatomischer Atlas der Pharmacognosie und Nahrungsmittelkunde von Dr. A. Tschirch, Professor der Pharmacognosie und Director des pharmazeut. Instituts der Universität Bern, und Dr. O. Oesterle, Assistent am pharm. Inst. d. Univ. Bern. Lieferung 12. 1897.

Verlag von Julius Springer—Berlin. Die neuen Arzneidrogen aus dem Pflanzenreiche von Dr. Carl Hartwich, Professor der Pharmacognosie am Eidgenössischen Polytechnicum in Zürich. Ein Band., pp. 469. 1897.

—— Vierteljahresschrift über die Fortschritte auf dem Gebiete der Chemie der Nahrungs- und Genussmittel, der Gebrauchsgegenstände sowie der hierher gehörenden Industriezweige. Mit der Redaction beauftragt: Dr. A. Hilger. Zwölfter Jahrgang. Das Jahr 1897. Erstes Heft, pp. 1—152.

Verlag: Art. Institut Orell Fuessli—Zürich. Manuale der neuen Arzneimittel für Apotheker, Aerzte und Drogisten, enthaltend über 2000 neue und neueste Arzneimittel, zusammengestellt von J. Mindes, Magister Pharmaciæ. Ein Bd., pp. 335. 1897. M. 4.60.

Verlag von Gebrüder Borntraeger—Berlin. Grundprobleme der Wissenschaft. Briefe eines unmodernen Naturforschers von Dr. Adolf Wagner. Ein Bd., pp. vi, 255. 1897. M. 5.00.

Author. — Beiträge zur Entwickelungsgeschichte pharmacognostisch wichtiger Samen. Inaugural Dissertation zur Erlangung der Doktorwürde vorgelegt der hohen philosophischen Fakultät der Universität Bern von Julius Otto Schlotterbeck, Michigan. Pamphlet, pp. 55, with five lithographic plates.

Koloniaal Museum te Haarlem. Bulletin, Juni 1897. Inhoud: I. Lijst van insecten, schadelijk vor de koffiecultur. II. Beschrijving der schadelijke insecten van de kina. Pamphlet, pp. 18.

—— Bulletin, Juli 1897. Inhoud: Verslag over het jaar 1896, met Bijlagen.

Reviews.

Die Neuen Arzneidrogen aus dem Pflanzenreiche. Von Dr. Carl Hartwich, Professor der Pharmacognosie am Polytechnikum in Zürich. Ein Band, 469 Seiten. Verlag von Julius Springer in Berlin. 1897. $3.80.

Wohl ist es ein verdienstvolles Unternehmen, das Gros der als vermeintlich neue Heilmittel durch die Fachpresse und durch die Handelslisten über den Tagesmarkt zu meistens ephemerem Dasein gelangenden Arzneidrogen von Zeit zu Zeit durch sachkundige Feder Revue passiren zu lassen; und das um so mehr, und mit desto grösserer Sichtung und Sonderung, als durch literarische und mercantile Speculation die zum Zwecke der Volksmedizin meistens längst abgesuchte und bekannte Flora überseeischer Länder neuerdings nicht selten für eine Blüthenlese angeblich neuer Pflanzenheilmittel herbeigezogen wird. Diese aber haben bei den meistens recht alten Volksstämmen auch neu erschlossener Länder, gleich den traditionellen Pflanzenmitteln des Mittelalters, ihre Prüfzeit grösstentheils längst hinter sich und das Bewährte ist mit den anderen Schätzen der alten Kulturwelt längst zugeführt und ausgenutzt worden. Das Facit dieser langen Suche und Sichtung ist daher in neuerer Zeit numerisch und relativ ein ausserordentlich geringes gewesen und der erweiterte Welthandel und Verkehr und alle mercantile und sonstige gewinn- oder ruhmsüchtige Speculation der Neuzeit haben nicht vermocht, dem Drogenmarkte und den Pharmacopöen eine nennenswerthe grössere Anzahl wirklich neuer und werthvoller, allgemein gebrauchter Arzneidrogen zuzuführen. Vielmehr ist die Zahl der letzeren nicht nur in den Arzneibüchern, sondern auch in der Volksmedizin stetig geringer geworden, trotz der speculativen Rüstigkeit des Drogenhandels, der pharmaceutischen Grossindustrie und der Fachpresse und der zum Theil durch diese Factoren grossgezogenen Sucht nach „neuen Mitteln“ und der Aera der Fluid-Extraxte, der Concentrationen der Eclectiker und der Organo-Therapie. Bekanntlich ist in dieser steeple chase der Apotheker der „ehrliche Makler“, welcher für diese Art Sport für den unliebsamen Gewinn einer Curiositätensammlung ephemerer und absoluter Arzneimittel die Unkosten zu tragen hat.

Nicht nur die Fülle, sondern mehr noch die Leichtfertigkeit, mit der vermeintlich oder angeblich neue Arznei-Drogen und Mittel jetzt in die Preiscourante der Drogisten und Fabrikanten und durch deren Speculation in Gratisproben auf die Tische der Aerzte und in die Kliniken lanzirt werden, legen den Wunsch, ja das Erforderniss nahe, eine übersichtliche Zusammenstellung neuer Mittel nicht blos separatweise, sondern auch mit möglichst strenger Sichtung und Sonderung zu vollziehen. Nur dadurch kann die Hochfluth ephemerer Speculationsartikel eingedämmt und der Drogenmarkt, die Arzneibücher und die Fachliteratur von minderwerthigen Novitäten und entbehrlichen Paralelmitteln resp. Substituten gesäubert werden. Ohne prompte Kritik und vorläufige besonnene Ablehnung speculativer Novitäten werden mercantile Gewinnsucht und beruflicher Dilettantismus das Chaos neuer problematischer Mittel stets vergrössern.

Erfüllt das vorliegende Werk als referirende Compilation und als Nachschlagebuch seinen Zweck in trefflicher Weise, so hat es in der unbeanstandeten Aufnahme von vielem ungeläutertem Material auf Treu und Glauben zu weite Toleranz walten lassen. Sonst aber ist die Bearbeitung desselben eine sorgfältige und umsichtige und bekundet sich der durch frühere Arbeiten und durch seine schöne Schrift: „Die Bedeutung der Entdeckung Amerika's für die Drogenkunde“ auch im Auslande wohl bekannte und geschätzte Verfasser durch dieses Werk und durch das treffliche Einleitungskapitel zu demselben als gewandter und sachkundiger Pharmacognost und Schriftsteller.

Verfasser und Verleger des trefflichen Buches haben sich durch dessen Herausgabe ein anerkennenswerthes Verdienst erworben, welches in weiteren Ausgaben durch eine wünschenswerthe, zweckmässige und zulässige strengere Sichtung und Sonderung in der Auswahl und Aufnahme des Materials dem Berufe und der Wissenschaft in noch höherem Maasse zu gute kommen kann und sollte.

Für eine fernere Fortführung und Neubearbeitung des Buches mag es zweckdienlich sein, auf einige bei den betreffenden Artikeln vielleicht übersehene, indessen berücksichtigungswerthe Arbeiten zu verweisen; diese sind unter anderen die Arbeiten von Prof. Dr. Power über die „Loco“kräuter (Pharm. Rundschau 1888, S. 101; 1889, S. 134 und 168); über Robinia (ibidem, 1890, S. 19); von Prof. Lloyd über Cimicifuga (ibidem, 1886, S. 30); von Dr. C. Mohr über Perezien (ibidem, 1884, S. 1); von Prof. Maisch über Xanthoxylum (Am. Journ. Pharm. 1890, p. 321); sowie Arbeiten über Polygala Arten (Pharm. Rundschau 1889, S. 86, 191 und 236 und 1892, S. 51) und über Gleditschia (ibidem, 1887, S. 114, 249, 250 u. 272).

Bei der durchweg genauen Literaturangabe im Texte war die Zugabe einer Liste der einschlägigen periodischen Fachpresse schwerlich nöthig. Die theilweise Aufzählung derselben enthält bei der bekannten unfertigen Kenntniss deutscher Authoren und Journalisten über die überseeische Fachpresse manche Irrthümer. So sind höchst geringwerthige Blätter aufgeführt, welche im Texte nicht einmal citirt worden sind oder werden konnten (No. 57) und längst eingegangene aufgezählt (No. 113. 132. 139. 143.), während andere im Texte citirte Journale in der Liste unerwähnt geblieben sind, z. B. das „Druggist's Circular“, oder in der Angabe des Titels oder des Verlagsortes unrichtig bezeichnet sind (No. 73. 81. 84. 112. 123. 133.). Ob die im Texte und in der Liste nicht genannten jährlich erscheinenden “Proceedings of the Amer. Pharmaceutical Association“ unberücksichtigt geblieben sind, ist im Buche nicht ersichtlich. Dasselbe gilt für den monatlich erscheinenden „Western Druggist“, für den halbmonatlichen „Americ. Druggist and Pharmaceut. Record“ und für das verbreitetste englische Wochenblatt „Chemist and Druggist“.

Fr. H.

Jahresbericht der Pharmacie. Herausgegeben vom Deutschen Apothekerverein. Bearbeitet von Dr. Heinrich Beckurts, o. Professor an d. techn. Hochschule in Braunschweig. 30. Jahrgang, 1895 (Der ganzen Reihe 55. Jahrgang). Vandenhoeck und Ruprecht, Göttingen 1896. M. 22.00.

Somewhat more than a year ago the writer reviewed the German Jahresbericht at some length, without, however, going into the details of the work. Special attention was called to the importance of general reports of a year's progress made not only by the different sciences, but in

the various departments of one and the same science. The writer had no intention to depreciate the valuable work done by the author and publishers of the Jahresbericht. He himself has had too frequent occasion to make use of this annual. At times it was the only means of securing the desired information. Again on other occasions it was found useful, because it facilitated the finding of information widely distributed though available in the original form. "Of the three annual reports that of the German Apothecaries' Society is not only the oldest, but also the most complete," were the words in which the writer expressed his appreciation of the Jahresbericht.

The statement that the Jahresbericht is not ideal is not necessarily derogatory to the report as far as it goes. The author of the report will certainly be willing to admit that with the aid of five or ten co-laborers he could get out a better report than with but one. This is nothing discreditable to the author or his assistant, whose herculean labors command admiration.

To criticize does not necessarily mean to condemn. What the writer desired to emphacize in connection with the Jahresbericht, as well as in connection with the Report on the Progress of Pharmacy of the American Pharmaceutical Association, was the need of annual surveys, Jahresüberblicke, as well as of catalogues of abstracts. Such surveys constitute the most important part of several annuals, e. g. in the field of chemistry. Such a report on the sugars, written by Prof. Stone for the American Chemical Journal, will be found in part on an other page of this number.

Without underestimating the importance of the work done by the reporters on the progress of pharmacy in Germany, England and in this country let us hope that the near future will witness an extension of their work, not so much in the line of greater completeness of the abstracts catalogued, but in the addition of a new department that will enable others than the specialist to learn just what progress has been made in the various departments of pharmaceutical activity.

E. K.

Anatomischer Atlas der Pharmacognosie und Nahrungsmittelkunde von Dr. A. Tschirch, Professor der Pharmacognosie, Direktor des pharmazeut. Institutes der Universität Bern, und Dr. O. Oesterle, Assistent am pharmazeut. Institute der Universität Bern. Leipzig, Chr. Herm. Tauchnitz. 1897.

Number 12 of this invaluable work deals with the nutmeg and mace, *Myristica* sps., flaxseed, *Linum usitatissimum* L., valerian root, *Valeriana officinalis* L., coca leaves, *Erythroxylon coca* Lam., and Paraguay tea, *Ilex paraguayensis* Lamb., and other *Ilex* species.

Myristica fragrans Houtt., the common nutmeg, and *Myristica argentea* Warb., the long nutmeg, sometimes called the Makassar or Papuan nutmeg are very thoroughly described and freely figured. In addition to a description of the adult plant and its parts, a very detailed description of the embryology is given. The common nutmeg differs from the long nutmeg mainly in its external form and size. The former is usually from 20 to 30 mm. long and 15 to 20 mm. wide; the long nutmeg is longer and narrower, 20 to 45 mm. long and 13 to 25 mm. wide and is broadest at the base. Some histological differences are also to be noted. It is not regarded as important, however, in a commercial way, to separate these kinds, since they are of about equal quality.

The genuine Banda mace is the arillus from the seed of *Myristica fragrans*; the same structure from *Myristica Malabarica* Lam., Bombay mace, is not fragrant and is used as an adulterant. The Papuan mace from *Myristica argentea* Warb. is fragrant and in structure resembles the Banda mace. Much interesting detail is given for which the reader must turn to the original.

The remaining subjects discussed are likewise fully treated. The quality of matter, printing and plates of the present number is of the same high standard we have noted in the foregoing parts.

Rodney H. True.

Grundprobleme der Wissenschaft. Briefe eines unmodernen Naturforschers von Dr. Adolf Wagner. Ein Bd., pp. VI, 255. Berlin, Gebrüder Borntraeger. 1897. M. 5.00.

Dr. Wagner has long held that the whole world of science, and especially biological science, has been following false gods for the last half century and more. This work is intended to make clear the philosophical defects of modern science and to present a truer conception of nature than that which science affords. It is divided into two parts, the first treating of general philosophical principles, the latter concerned with special problems, and especially with showing the true relation between plant and animal.

The current science which looks to stating its results in terms of matter and motion can not distinguish the vegetable kingdom from the animal, and so asserts the existence of forms of life intermediate between the two great kingdoms. Wagner, who studies the problem not merely from the physiological side, but from the side of psychology, finds an absolute difference in the possession by the animal of sensations and consciousness.

This illustration shows the "unmodern" character of the work, which will probably gain the hearing that usually falls to works out of sympathy with ruling ideas. It is, however, well worth reading for its matter, and is written in a clear style and lively manner which make it enjoyable.

E. A. Birge.

Lexikon der gesamten Technik und ihrer Hilfswissenschaften. Herausgegeben von Otto Lueger im Verein mit Fachgenossen.
Lieferung XXI: Grundwasser—Herzstück.
" XXII: Hessische Kurve—Isolator.
" XXIII: Isolirschichten—Kataster.
1897. M. 5.00 pro Lieferung. Preis des ganzen Werkes M. 175.00.

This excellent work is progressing as rapidly as is consistent with good work. The three numbers before us make the same favorable impression left by their forerunners. Inasmuch as two additional Lieferungen will complete the fifth volume it will more satisfactory to postpone a detailed review until the completion of the volume. Originally this was to have completed the work, but a mere glance at the primes will make it doubtful whether the further allowance of two volumes will suffice. Inasmuch as the subscriber will receive gratis anything above seven volumes, he can gain only by this liberal policy.

E. K.

Erster Decennium der Helfenberger Annalen, 1886|1895. Eine Zusammenstellung der Werthe, Methoden und Studien. Herausgegeben von Eugen Dieterich. Ein Band, pp. 462. Verlag von Julius Springer, Berlin. 1897.

Shortly after the establishment of the Helfenberger Fabrik, its manager, Eugen Dieterich, began to publish the various scientific investigations conducted there, together with business communications, in the form of "business reports." Later, in 1886, he decided to separate the scientific from the purely commercial reports, and thus appeared the "Helfenberger Annalen," which have been published annually since that time.

The aim of this new periodical was to publish the results obtained in the analysis of crude drugs and galenical preparations, the original analytical methods devised as well as other original work, and lastly, the critical experimental examination of the methods proposed by other investigators. In all of this work the author confined himself to such substances as were employed in his laboratories, and did not intend to cover all the articles of the materia medica. The fact that generally very large quantities of material were worked upon, and that the results often represent a considerable number of determinations, makes the data obtained all the more valuable.

After ten years of successful publication of the "Annalen," the author decided to arrange in groups all of the work that had appeared in that time; also, to compile all the numerical results in tables and thus allow of ready survey of the whole. The result is to be found in the volume now before us.

The book is divided into two parts, of which the first deals with crude drugs; the second, with galenical preparations. The first part treats particularly of gums, resins, fixed oils and fats, volatile oils, waxes, and paraffines. In this part, the estimation of morphine in opium and work on Hübl's iodine-addition method for the identification of fats, oils, and resins have been given special consideration by the author, the space devoted to the former topic alone being over 100 pages. In the second part, among other galenical preparations, we find treated aromatic waters, fluid and solid extracts, iron preparations, tinctures, and ointments. Of these the work on alkaloidal estimation of extracts is especially thorough, while in the estimation of the so-called indifferent (colloidal) iron compounds, as lactosaccharate, dextrimate, albuminate, peptonate, etc., the author has given us the results of his experience in one of his special lines of work.

The work on the whole, in its present convenient form, is a great aid to all who are engaged in manufacturing pharmacy, whether on a large or small scale. The experiences of the author during the last decade should also be of considerable value to the Pharmacopœia Committee of Revision. With the completion of this volume, the author resigns the editorship of the Helfenberger Annalen, entrusting it to his son Karl, the present technical head of the establishment. May he nevertheless continue in the future in his valuable contributions to pharmacy as he has done in the past.

Richard Fischer.

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SEE IT DISSOLVE

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(Formerly **Pharmaceutische Rundschau.**)

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EDITORIAL.

American Pharmaceutical Association.

During the past month a number of national pharmaceutical organizations held their annual meetings: the British Pharmaceutical Conference met at Glasgow; the German Apothecaries' Society at Strassburg; the Swiss Apothecaries' Society at Solothurn; but it may be safely assumed that the American Pharmaceutical Association for 1897 had the ideal place of meeting. Like the White Mountain meeting in 1892, this year's gathering on the shores, or more correctly, in the centre of that group of lakes and bays known collectively as Lake Minnetonka, will long be remembered by those who attended.

Although the attendance was fair and though the sessions were well attended, the distance of the place of meeting from the centre of membership made itself felt. However desirable it may be to meet from time to time in sections of the country where the membership of the association is not strong, it must not be forgotten that any organization depends for its best work not so much on large numbers or new comers, but on the older members who have been faithful and constant in their service.

Not many years ago the association was carried away by the enthusiasm of some who should have liked to see every druggist in the and a member of the American Pharmaceutical Association. It is fortunate for the association that this dream was not realized. Not only has this dream fallen short of realization, but many of the large number of new members admitted annually dropped off after having been members for a year or two. Indeed the percentage of those who, after being elected, did not complete membership, is by no means insignificant. The information that this year a larger percentage had at the time of meeting completed membership than ever before was, therefore, greeted with applause. It should be mentioned in this connection that over forty of these new members are apothecaries of the U. S. Army and Navy, for the improvement of whose position the Association has been active during the past few years.

Whereas no business of an epoch-making character was transacted, a number of propositions of considerable import came up for consideration. On the one hand there was, as usual, a tendency here and there to rush the work of the association; on the other hand a lack of preparation to properly discuss the work manifested itself. Thus, e. g., most members are not sufficiently acquainted with the work of the various standing committees. Their reports are read hastily or only in part, so that even those who are somewhat familiar with the work of a given committee are, nevertheless, not ready to commit themselves and the association by voting aye or nay on a set of resolutions.

It certainly would be a great advantage to have most or all of the committee reports printed together in advance and mailed to the members of the association. Each person would thus have an opportunity at least to familiarize himself with the past work of the committees and their recommendations for the future. If the ten, twenty or thirty minutes now spent in hastily reading a report could be utilized for its better discussion, a material gain would accrue to the sessions. Thus certain reports year after year are read and allowed to take "the usual course" without a word of comment. Other reports are read in part when it becomes apparent that in order to take rational action it is necessary to read the report a second time; or, if time presses, the part read is summarily disposed of without query or comment.

A similar indiscriminating custom prevails as to the reading of papers. A person who has a paper with possibly a single item of interest is accorded as much time as he who has a most interesting and valuable paper to present. If the reading of a paper actually requires less than five minutes, the speaker has the right to use the other five minutes allotted him to recapitulate what he has already read. It seems that some regard should be had for the relative value of papers and the time necessary for their reading. Furthermore it might be well to provide in advance for a proper discussion of some of the more important topics presented.

Last year the **Commercial Section** managed to dispose of one of the two sessions allotted to it in a rather grotesque manner. This year it seemed equally difficult to dispose of part of the time allotted to this section for a single session. Last year at least one paper besides the chairman's address was read. This year there was none.

Almost every year some person considers it his duty to remind the members that the American Pharmaceutical Association was founded by retail pharmacists for the retail pharmacists. Some other person will inform the association that he is not so much interested in the discovery of a new alkaloid by some ultra scientist—this in the minds of many is still the highest goal of scientific research, though the discovery may be but accidental—but that he has come to consider matters which to him mean dollars and cents. The intensely "practical" man begrudges the success the scientifically inclined member has achieved, yet he does not offer to raise a hand to redeem the commercial section in its rapid race to ridicule.

The majority of the members in attendance at the Minnetonka meeting were practicing pharmacists. Deduct those college professors who also own and conduct pharmacies and scarcely more than a handful of professors and journalists will remain. Yet this large majority of practicing pharmacists could not make a success of a single session of this section. The patent and trade-mark question, the free alcohol problem and others of like commercial import have been monopolized by the section on education and legislation until nothing seems to remain for this section except to simply perpetuate its organization. It has been remarked in a sarcastic manner that next year the section is to be run "along entirely new lines." Whether new or old let us hope that the next year will either revive this section to a respectable activity or effectually bury it.

The **Scientific Section** came very near meeting with a sad fate. Two of the sessions were practically abandoned. This was partly due to a misunderstanding with regard to a number on the social program. Besides, the attraction of an excursion to the Twin Cities on a beautiful morning proved too great when counterbalanced by the prospect of three stiff sessions of the scientific section in one day. Fortunately the officers of the section and a few others supported by a number of late risers managed to dispose of the routine thus leaving the third or evening session for the reading and discussion of reports and papers. This evening session was well attended and every one, realizing his responsibility for the partial failure of the two days' sessions, entered upon the work with an earnestness seldom witnessed, the section remaining in session until after midnight.

Especial attention should be called to the work of the Special Committee on Research under the able chairmanship of Prof. Prescott. This committee was created by the section at the suggestion of Dr. Alfred Dohme, when chairman, at the Denver meeting. Last year at Montreal it made its first report and was reorganized on a somewhat better basis. The U. S. P. Revision Committee is represented on this committee by its chairman and has given the special committee substantial assistance. As time goes on this committee ought to grow stronger and accomplish valuable results.

The number and quality of papers in general was fair and several were good and very valuable. The discussion of the papers, however, was not what it ought to have been. A noteworthy inference could be drawn by any observant listener. Those statements which had little or no experimental evidence to back them gave rise to some of the liveliest discussions. This were not strange, but for the fact that an exceedingly simple test or a series of simple experiments would at once settle the whole controversy. Such a state of affairs indicates an incompleteness in a paper which could easily and should be avoided.

The **Section on Education and Legislation** was conducted much more creditably to the association than last year. Moreover the Scientific Section is indebted to this section for the reading and discussion of several scientific papers which otherwise could have been read by title only.

The work of the section was notably along the line of legislation, education receiving but minor attention in only a few papers. Two years ago an important duty was assigned to this section and a large amount of work was creditably performed by its secretary. An acceptable report of progress was made last year and the chairman was requested by a formal resolution to appoint a committee of three to continue the work already done and to seek the cooperation of the state pharmaceutical associations, state boards, and schools and colleges. The sense of the meeting with regard to this committee was freely and unmistakably expressed but, as was shown this year, totally ignored. The result was that the report as presented was ordered to be printed and distributed without a discussion. Unfortunately a number of papers met with a similar fate.

The final outcome of all this is rather unfortunate. There is little sense in merely listening to papers while sitting on uncomfortable chairs and when the speaker has to compete with an orchestra stationed on a veranda not far off. We might read the same papers, when printed, at home in greater comfort. Aside from the personal and social features of such a gathering, the American Pharmaceutical Association should come together for the purpose of discussion.

In trying to get an expression of opinion from the various state associations, state boards and colleges and schools, the committee, on account of the lateness of its action, met with a signal failure. In possibly no small number of instances the votes collected expressed the opinion of a single person, not of a society, or board or educational institution. This will continue if no other way of rousing the interest of the masses can be found.

To formulate a model pharmacy law requires more than a vote on a hundred or more questions. To quote a gentleman greatly interested in this movement, it requires the education of the American would-be pharmacist, an education which is not simply that of the colleges or universities.

To accomplish this education will require a large amount of earnest labor in the state associations and outside on the part of individual members deeply interested in this very important problem. The organization of the pharmaceutical state, the proper function of pharmaceutical associations, boards and educational institutions, the relation of these organizations to the state and vice versa, these are questions which should be broadly discussed before a model law is attempted in all its details. It is true that most of these questions have been discussed, but the discussion has largely been like that on the tincture of iodine in the scientific section. The discussions have largely been based on personal and local prejudices and have often revealed an astonishing disregard for, or even an ignorance of facts. We need first of all men who will make a special study of these problems, men who will look at them broadly and intelligently. This and the work of educating the pharmacist will not be accomplished in a year or two. In the attempt to create a "model" pharmacy law on paper we should, therefore, not look to what we might possibly accomplish in a year or two, but at what we should like to aspire to in the next generation.

The **Social Program** as carried out was greatly enjoyed by all who attended. Both the hotel and its immediate surroundings were well nigh ideal for a gathering of this kind, which partook almost of the character of a large family reunion. The weather was beautiful and lent its additional charm to the picturesque landscape. In addition to the usual features, such as a reception, a boat-ride on the Upper and Lower Lake, a trolley and carriage ride through the Twin Cities, etc., the visitors are indebted to the Local Committee for an intellectual treat of very high order. The thanks of the association were especially tendered President Northrop of the State University for the able and very interesting address on education given on Wednesday evening, also for the liberal manner in which all of the doors of the University were thrown open to the visitors on the following day.

It may not be amiss to call attention to the fact that two of the oldest colleges of pharmacy, arranged each a successful meeting of its alumni. It must have been gratifying to the representatives of these eastern institutions to meet so many alumni in the West, taking an active interest in the welfare of their calling. It is indeed a pardonable pride that manifests itself when the children of a common alma mater look backward to happy students' days and to honor themselves by kindly and gratefully remembering their departed teachers.

Since one of the drug journals announced very recently that a certain "idea" had finally captured the last stronghold of conservative American pharmacy and rejoiced editorially in this fact, it should be clearly understood that the members of the American Pharmaceutical Association know how to enjoy themselves without bringing their meetings down to the level of a Kirmis or county fair. It is for the very reason that the above mentioned announcement did not prove true that most of the members who were at Lake Minnetonka carry home with them the most pleasant recollections of this year's meeting. May the meeting at Baltimore in 1898 be equally pleasant and may we profit by some of this year's experiences and make it even more profitable.

E. K.

ORIGINAL CONTRIBUTIONS.

The Caffein Compound of Kola.*

Part. II.

KOLATANNIN.

By *James W. T. Knox* and *Albert B. Prescott.*

The investigation of the caffein compound in kola conducted by us last year[1] showed that it was a kolatannate of caffein instead of a glucosid as formerly supposed. This question then arose: Is the tannin of this body identical with the free tannin existing in the kola nut? In the very brief examination made at that time it seemed that there was some difference, for combustions of both kinds of the tannin showed a difference in the respective amounts of carbon and hydrogen of each. No interpretation of the results was made at that time, for we considered the data insufficient, and the question was not settled.

It became necessary, in order that this point might be positively determined, to make a thorough comparative study of these two forms of kolatannin and the research has been continued along this line with results which are stated in the following pages.

Classification of Tannins.

Several different means of classifying tannins have been proposed, such as "physiological" and "pathological"—referring, of course, to their origin in the plant; glucosidal and non-glucosidal; "iron-blueing" and "iron-greening"; tannins which are tanning agents and those which are not; those which yield a tri-hydroxy-phenol by sublimation or by fusion with potassium hydroxid, and those which yield a dihydroxy-phenol by sublimation, or the salt of a dihydroxy benzoic acid by gentle fusion with potassium hydroxid.[2]

Trimble[3] suggests a classification, not as a final one but which answers very well for the present, in view of the still very defective knowledge of this class of bodies. He proposes a division of them into "the gall tannin group" and "the oak tannin group." The tannins of the gall tannin group contain 50—52.5 p. c. of carbon and 3.10—4.50 p. c. of hydrogen; those of the oak tannin group contain, in round numbers, 60.00 p. c. carbon and 5.00 p. c. hydrogen. This classification holds good for the following reactions also:

	Gall Tannin Group.	Oak Tannin Group.
Ferric salts.	Blue color and precipitate.	Green color and precipitate.
Calcium hydroxid.	White precipitate becoming blue.	Light pink precipitate becoming red and then brown.
Bromin water.	No precipitate.	Yellow precipitate becoming brown.

Under this classification kolatannin is to be compared with the oak tannin group, for its composition and reactions coincide more nearly with those of oak tannin than with those of gallotannic acid. We include herewith a brief summary of some important work done on oak bark tannins, not only for its historical interest, but because it has a bearing indirectly upon our own work on kolatannin.

Recent Literature of Oak Bark Tannin.

In February 1880 Böttinger[4] published a lengthy article on "oak red," phlobaphene and tannin which was followed about a month later by Etti's[5] publication of his own work on oak tannin—a valuable contribution to its literature. The methods used by them for preparation of their working samples differed radically, the botanical source of their barks or extracts was unknown to them (or, if known, was not stated), the tannins obtained possessed properties different from each other, and it is not strange that the results obtained by these investigators were at variance in many particulars. If we may judge by their descriptions, it would seem that Etti's method of separation was much more likely to yield a pure product than that used by Böttinger, although by no means free from objections. Without doubt this work of Etti and that of Löwe[6] dated in September of the same year, but which did not appear until the following year added more to the knowledge of oak tannins than any previous contributions had done. The methods used by them are noteworthy, because they were radical departures from the old lead acetate methods formerly so much in vogue.

Etti extracted the oak bark with very dilute alcohol under gentle heat and added acetic ether and ordinary ether to the extract. After agitating, the faintly red-colored ethereal layer was separated, the ether recovered by distillation and used again for the same purpose. After distilling the ether, the alcoholic solution of tannin remaining behind was found to contain some crystals of ellagic acid which were removed by filtration and the filtrate evaporated to dryness on a water bath. The residue, a reddish-white powder, was oak tannin, mixed with a little phlobaphene, amorphous resin and gallic acid; the two last named substances were separated by extracting the powder with non-alcoholic ether; it was next treated with a mixture of three parts acetic ether and one part ethyl ether, which removed the tannin and left the phlobaphene undissolved. After distilling off the solvent, the pure tannin remained behind as a reddish-white powder. Etti insists, too, that if the ethyl acetate be used again for a solvent it must be washed with sodium hydroxid solution and redistilled before use, as the tannin tends to decompose it slightly into acetic acid and alcohol, while the tannin is itself partially converted into its anhydrid.

The method of Böttinger depends on the separation of phlobaphene from tannin solutions by means of its comparative insolubility in water. The tanbark is extracted first with ether, then with alcohol, the alcohol solution is evaporated to dryness, and the residue extracted again with ether which removes the last traces of wax and fat. By warming the residue with water on a water bath, a partial separation is effected of the insoluble phlobaphene from the soluble tannin. After filtration the tannin solution, still containing traces of phlobaphene, is repeatedly evaporated and redissolved, until upon diluting the liquid very largely, and cooling it, no precipitation is had. On evaporating this solution, a light colored residue is obtained which is soluble in water and which he considered the pure tannin.

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* Read at the Minnetonka meeting of the A. Ph. A.

[1] Knox and Prescott, 1896: Proc. Am .Pharm. Assoc., 44, p. 136.

[2] Prescott: Organic Analysis, p. 466.

[3] Trimble: The Tannins, II, p. 131.

[4] C. Böttinger, 1880: Annalen, 202, p. 269.

[5] C. Etti, 1880: Monatsh. f. Chem., I, p. 262.

[6] J. Löwe, 1881: Zeitsch. f. Anal. Chem. 20. p. 208.

Löwe[7] extracted the oak bark with 90 percent alcohol, and distilled the extract in vacuo to syrupy consistency. Water was then added, which precipitated a large quantity of anhydrids: after filtration common salt was added to saturation, which precipitated the remaining anhydrids completely. The liquid, after filtration, was agitated with ether repeatedly until this solvent would remove nothing further from the solution. The remaining ether was dissipated by gentle heat and after cooling the solution was shaken out with acetic ether. The acetic ether was removed by distillation and cold water was added to the remaining residue as long as precipitation ensued, after which it was again filtered and evaporated slowly in a vacuum desiccator to a dry mass, which is soluble in water and becomes cinnamon-brown on being pulverized.

It will be noticed that the methods of Etti and of Löwe have much in common, the principal difference from the other methods being in the use of ethyl acetate, an immiscible solvent. It is difficult to say to whom credit should be given for the first application of this solvent to the preparation of tannin. In 1873, however, Löwe[8] mentions having used it in his work on sumach tannin, while in 1872 he also made use of it as a separative solvent for gallotannic acid.

Etti ascribed the formula $C_{17}H_{16}O_9$ to his tannin: a "first anhydrid" $C_{34}H_{30}O_{17}$ was formed by heating the tannin at 140° C. He separated a ready-formed anhydrid from the bark, corresponding to this one, and made use of its barium salt $C_{34}H_{28}BaO_{17}$ to determine its formula. By boiling it with dilute hydrochloric or sulphuric acid, it loses another molecule of water, forming a second anhydrid, $C_{34}H_{28}O_{16}$. The third anhydrid he prepared by boiling the pure tannin with dilute mineral acid, whereby two molecules of tannin lost three molecules of water, forming a body to which he ascribed the formula $C_{34}H_{26}O_{15}$. This anhydrid corresponds, in Etti's opinion, to Oser's oak red. Boiling the pure tannin with potassium hydroxid solution for some time, formed the first anhydrid, identical with the so-called oak bark phlobaphene; this was separated by acidulating the alkaline solution with mineral acid and filtering out the precipitated anhydrid.

By various experiments, such as boiling the tannin with dilute acids, digesting it with ferments, etc., he arrived at the conclusion that oak tannin was not a glucosid, but that such evidence of glucose as had been found by other investigators was due to the accidental presence of glucose in the sample.

He proposed a structural formula, the same as that of digallic acid with three hydroxyl groups replaced by three methyl groups, he having detected methyl chlorid by burning the gas formed by heating the tannin with concentrated hydrochloric acid in a sealed tube.

Böttinger's work was principally on oak phlobaphene and oak red, which he considered identical. The oak red was formed by boiling the tannin with dilute mineral acid. He ascribed the formula $(C_{14}H_{10}O_6)_2.H_2O$ to it and believed oak tannin to be a glucosid.

Löwe proposed the formula $C_{28}H_{28}O_{14}$ for the tannin he prepared and $C_{28}H_{22}Pb_3O_{14}$ for the lead salt. He also prepared oak red by the usual process of boiling the tannin with dilute acids and obtained in addition to the oak red, $C_{28}H_{22}O_{11}$, a by-product of which he made a combustion, but did not identify. It was not sugar, however, and he states that oak tannin does not conduct itself as a glucosid. The oak phlobaphene is, according to his statements, a fourth anhydrid of oak tannin of the formula $C_{28}H_{24}O_{12}$, and forms a lead salt $C_{28}H_{22}O_{12}Pb$.

A somewhat extended and not altogether good-natured controversy between Böttinger and Etti followed the publication of the latter's paper, Böttinger[9] insisting upon the correctness of his own work, and holding to his first statement that oak tannin was a glucosid. Etti,[10] on the other hand, contended that Böttinger's methods were faulty, that ready formed glucose would not be separated from the tannin by Böttinger's process, and therefore sugar would of course be found in the solution after boiling the tannin with dilute acids. He performed a number of experiments tending to prove the correctness of his position, following Böttinger's methods also and criticising him severely. Böttinger[11] subsequently modified his statements considerably, but without conceding anything of importance.

In 1883 the next contribution appeared, in which Etti[12] again commented on Böttinger's work and quoted Löwe in confirmation of his own results. He reported a new tannin, of formula $C_{20}H_{20}O_9$, from *Quercus Pubescens*, while the other he had since learned was from *Quercus Robur*. This new tannin colored solutions of ferric salts green, while the first one produced a blue color with them. During this investigation the objection already noted to the use of ethyl acetate, viz. its tendency to decompose the tannin, became so marked as to necessitate a different method of separation. The most important points of this new method are the use of alcoholic ether as a solvent for the tannin, phlobaphene and green resin. The resin is removed from the resulting product by benzene and the phlobaphene by careful addition of lead acetate to the tannin solution. The precipitate of lead tannate is yellow, but if any anydrid (phlobaphene) be present, the precipitate will be colored more or less reddish-brown, depending on the proportion of it to the tannin. Lead acetate is added until the color of the precipitate indicates that all of the anhydrid has been precipitated. After filtering, the liquid is again exhausted with alcoholic ether, the ether removed by distillation and the residual liquid evaporated to dryness on the water bath. A rather remarkable peculiarity of Etti's work is that both of these tannins are nearly insoluble in water—.6 of tannin in 100. of water—while the experience of other workers has been quite generally that tannins are soluble.

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[7] J. Löwe, 1873: Zeitsch. f. anal. Chem. 12, p. 128.
[8] J. Löwe, 1872: Zeitsch. f. anal. Chem. 11, p. 365.

[9] C. Böttinger, 1881: Berichte, 14, p. 1598.
[10] C. Etti, 1881: Berichte, 14, p. 1826.
[11] C. Böttinger, 1881: Berichte, 14, p. 2390.
[12] C. Etti, 1883: Monatshefte, 4, p. 512.

Etti claims to have formed four anhydrids of this tannin, $C_{20}H_{20}O_9$.

First anhydrid,	$C_{40}H_{38}O_{17}$.	Oak phlobaphene, dried at 120°.
Second "	$C_{40}H_{36}O_{16}$.	By boiling phlobaphene with 1:12 sulfuric acid and washing precipitate first with water, then with alcohol and evaporating the alcoholic solution.
Third "	$C_{40}H_{34}O_{15}$.	Dried at 125°. By boiling tannin with dilute sulfuric acid and collecting the precipitate.
Fourth "	$C_{40}H_{32}O_{14}$.	By heating in 25 p. c. sulfuric acid containing 20 p. c. alcohol in sealed tube at 130° for four hours.

Etti believed also that four anhydrids were formed from the other tannin ($C_{17}H_{16}O_9$) and gave this view support by his own figures and some also of Oser, of Böttinger, and of Löwe. This would be apt to mislead the casual reader into attaching more importance to this theory of the four anhydrids, than is warranted by the actual results given by Etti. It would hardly seem that he was justified in making this use of the work of the other investigators. As a matter of fact he has selected figures here and there which gave support to his views, but ignored others of equal importance which did not harmonize with his ideas, e. g. he quoted Löwe's figures for the analysis of oak red, but did not mention his work with the lead salts of oak red, which brought him to the conclusion that the formula of oak red was $C_{28}H_{22}O_{11}$. There is no apparent reasen for doubting that this work was equally as reliable as that which Etti quoted, and to omit it gives a careful reader the impression that deductions made from such peculiar isolated facts would not necessarily be of great value. The chart is here appended:

		Calculated.	Found.			
Tannin, $C_{17}H_{16}O_9$.	Carbon	56.04	56.31	56.06		
	Hydrogen	4.40	4.63	4.69		
First Anhydrid, "Phlobaphene", $C_{34}H_{30}O_{17}$. Grabowski's oak red.	Carbon	57.46	57.28	57.62		
	Hydrogen	4.22	4.64	4.33		
Second Anhydrid, $C_{34}H_{28}O_{16}$.	Carbon	58.96	58.76			
	Hydrogen	4.04	4.20			
			By Oser.	By Böttiuger.		By Etti.
Third Anhydrid, $C_{34}H_{26}O_{15}$, Oser's oak red.	Carbon	60.58	60.70	60.19	60.08	60.33
	Hydrogen	3.86	4.03	4.22	3.94	4.03
			Found by Löwe.			
Fourth Anhydrid, $C_{34}H_{24}O_{14}$, Löwe's oak red.	Carbon	62.20	62.339	62.197	61.997	
	Hydrogen	3.66	4.154	4.015	4.056	

Böttinger[13] published in the same year, 1883, a piece of work done on the bromin derivatives of oak tannin. By direct addition of bromin to the watery extract of oak bark he formed a dibrom oak tannin, $C_{19}H_{14}Br_2O_{10}$, which was capable of forming a pentacetyl derivative. "By careful manipulation"—he does not describe it—he converted the dibrom- into a tetrabrom-tannin, which also formed a pentacetyl compound. This seems to be the first work on bromine derivatives.

In 1884[14] he investigated hemlock tannins by means of their bromin-compounds precipitated directly from its infusion by addition of bromin. Later[15] in the same year he prepared bromin compounds of a number of bark tannins by adding bromin directly to their infusions. Acetyl compounds of these were formed and analysed.

Etti,[16] in a brief paper shortly afterward, discussed the points of difference between gallotannic acid and oak tannin. He also pointed out that by reason of its very hygroscopicity acetic anhydrid was not a proper agent for determining the number of hydroxyl groups of tannins, as its tendency would be to form anhydrids which in turn would be acetylised and lead to incongruous results in the analysis.

Böttinger,[17] in 1887, published an article principally on oak wood tannin, which he separated by dissolving commercial oakwood extract in twenty parts of water and allowing it to stand. The clear liquid was evaporated to dryness and boiled with acetic anhydrid, which formed an acetyl compound whose composition corresponded to formula $C_{15}H_7(C_2H_3O)_5O_9$. From this he recovered an anhydrid of oakwood tannin and formed mono- and tetra-brom derivatives of it.

In 1889, Etti,[18] adhering to his previously published formulas for oak tannins, gave the results of an investigation of a tannin from the common Slavonian oak, to which he gave the formula $C_{16}H_{14}O_9$. It was nearly or quite insoluble in water. He formed several soluble magnesium salts with this tannin and suggested that it might exist in the plant in this form, thus accounting for its solubility in an aqueous menstruum when first extracted. Several anhydrids were formed.

Any *résumé* of the literature of oak tannins, however brief, would be incomplete without reference to the work of Trimble.[19] His monograph in two volumes contains a praiseworthy compilation of previous literature on the subject and full accounts of his own work. He has the credit of introducing acetone as an extractive menstruum for the oak tannins, instead of alcohol. This solvent is said to act particularly well with oak bark. A good bibliography concludes the work. He has confined himself thus far to analyses of the pure tannins and does not as yet propose formulas. In addition to the monograph just mentioned, he has been a frequent contributor on this subject in the periodical literature of chemistry.

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[13] C. Böttinger, 1883: Berichte, 16, p. 2710.

[14] C. Böttinger, 1884: Berichte, 17, p. 1041.

[15] C. Böttinger, 1884: Berichte, 17, p. 1123.

[16] C. Etti, 1884: Berichte, 17, p. 1820.

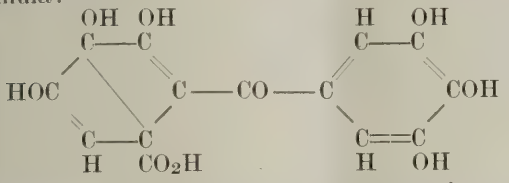
[17] C. Böttinger, 1887: Annalen, 238, p. 366.

[18] C. Etti, 1889: Monatshefte, 10, p. 647.

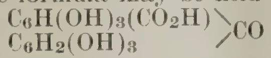
[19] H. Trimble, 1894: "The Tannins." A monograph, J. B. Lippincott Co.

Late Work of Schiff on Digallic Acid.

In the present year, Hugo Schiff (Gazzetta, 1897, 27, i, 90), having already found that natural tannic acid is possessed of a slight optical activity, namely dextrorotatory, inquires as to its containing in some way a symmetric carbon, and infers a ketonic structure, with six hydroxyl groups. He does not obtain a hydrazone from tannic acid. From experimental results he proposes this formula:



Irrespective of orientation, and for comparison of a kolatannin formula offered for consideration further on, the above formula may be held simply as



$$\left.\begin{array}{l}C_6H(OH)_3(CO_2H)\\C_6H_2(OH)_3\end{array}\right\rangle CO$$

Caffeotannic and Caffeic Acids.

The literature of caffeotannic acid, of the formula $C_{15}H_{18}O_8$, dates from Rochleder, in 1846.[20] Its production of caffeic acid (dihydroxy phenyl acrylic acid), along with sugar, was set forth by Hlasiwetz in 1867.[21]

A few years ago, caffeic acid was obtained from the tannin of coffee, also from the tannin of the maté, by H. Kunz-Krause.[22] Very recently the same author has investigated caffeotannic acid.[23] In his report[24] he finds confirmation of the composition of caffeic acid as a dihydroxy phenyl acrylic acid. His analyses obtain the carbon dioxide given off when the caffeic acid is heated to 200° C., and are confined to this analytic method. A residue of a vinyl pyrocatechol is predicated. The author recognizes a class of bodies which he terms glucotannoids.

"FREE" KOLATANNIN.

Preparation of the Sample.

The amorphous character of tannins together with their extreme liability to decomposition, renders their separation and purification very difficult. The method used by us last year,[25] in the very brief examination of kolatannin, was based on that of Allen,[26] being fractional precipitation with lead acetate.

On taking up the work this year, it soon became evident that whatever may be said of lead acetate methods as applied to other tannins, they certainly are unsuited to this one, for various reasons. The lead kolatannate, being bulky, is extremely slow and difficult of filtration, and the tannin in this state exhibits a marked tendency to pass into insoluble forms, principally anhydrids. During the washing, the lead salt becomes gradually darker, and this tendency is favored by the moisture present. If, on the other hand, the washing be less prolonged, the resulting product will be contaminated with various other constituents of kola extract, such as sugar, alkaloids, inorganic salts, coloring matter, etc. etc. It is indeed very doubtful if any usual amount of washing will remove these impurities, hence the purity of a tannin separated by precipitation with lead acetate would be regarded with too much suspicion to be employed in analytical work, even if its sensible properties were not changed during the treatment. Kolatannin was at first supposed and since determined to be soluble in water. But on evaporating the solution of tannin after removing the lead from combination by hydrogen sulfid, the end product was a red brown substance, insoluble in water, and possessing a not particularly astringent taste. So by the use of lead acetate a tannin is obtained whose purity is a matter of doubt, and whose properties have undergone radical changes during separation, both as to color and solubility. Furthermore we desired to effect a perfect separation of the free tannin from that existing in combination with caffein (as caffein kolatannate) in order to determine by analysis, whether they were identical tannins or not, the analysis of them last year having shown somewhat different values in each for carbon and hydrogen. Caffein kolatannate is sparingly soluble in water, more soluble in solutions of tannin and of caffein, so that the aqueous infusion of kola contains caffein kolatannate as well as free tannin, and the lead tannate obtained from it would be a mixture of the lead salts of both tannins, or both forms of tannin, and no delicate separation could be had in this way.

Plainly another method was necessary. The objections just noted were for the most part neither new, nor limited to kolatannin. As previously stated, Löwe in 1872, who had encountered many difficulties in the use of lead acetate for the separation of tannins, and found it necessary to employ other means to obtain a pure product, resorted to the use of ethyl acetate. This immiscible solvent proving satisfactory in many cases has since been used considerably, either alone or mixed with ether, in the separation of tannins for analytical purposes, and for some tannins at any rate is unquestionably the best separative solvent which has yet been given publicity as such. At the same time a single shaking out with ethyl acetate does not suffice for the preparation of a pure sample. More or less coloring matter will be found in the residue left on evaporating the first portion of the solvent, so that several repetitions of the process are required. Care must be used not to carry the method of purification too far, for if this be done the decomposition of the tannin is apt to prove a greater obstacle than the original impurities. We find that four or five repetitions of the "shaking out" give the best results. In detail the manipulations are as follows, and the method has given satisfactory results:

The fresh kola nuts are sliced into boiling alcohol,[27] removed after a few moments boiling, and dried in a current of warm air, then ground up to a number twenty powder and packed firmly in a percolator. The alcohol so used in sterilizing the drug is diluted to about fifty percent strength, and employed as a menstruum, with addition of sufficient dilute alcohol to complete the extraction. The highly colored extract of kola thus obtained is concentrated by distillation in vacuo, until the alcohol is all removed. This can be done with a good pump at between 18° and 20° C. The contents of the flask are then filtered, the insoluble portion being chiefly caffein kolatannate, while the solution contains caffein, kolatannin, caffein kolatannate, glucose, traces of fatty matter, and more or less colored derivatives of tannin according to whether the sterilization by boiling alcohol has been properly done. Common salt is then added to this filtrate to saturation and the caffein kolatannate is completely precipitated. It is filtered out and added to the first residue of caffein kolatannate. The reddish colored filtrate is then transferred to a large separatory funnel and agitated with chloroform repeatedly to remove alkaloids and traces of fat. The dissolved chloroform is then separated by agitation with small portions of ether. Kolatannin is insoluble in chloroform, and only very sparingly soluble in ether, so this treatment does not remove any considerable amount of it. Ethyl acetate is now added to the liquid in the separatory funnel and the liquid extracted with it as long as any tannin is removed. Usually eight, ten or even more successive portions are required for this. The united solutions of tannin in ethyl acetate are transferred to a distilling flask and concentrated to dryness under reduced pressure. To avoid loss of the ethyl acetate we use a condenser about a metre in length, and pack the receiver in ice. Sometimes also a condenser is placed between the pump and the receiver. With these precautions the waste is very slight. Before using the recovered ethyl acetate as a solvent again, however, it is washed with a weak solution of sodium carbonate and redistilled, to avoid the presence of any free acetic acid formed by decomposition of the ether. The statement of Etti already alluded to, concerning the decomposition of ethyl acetate by tannin, has not been found to apply to kolatannin, but the washing was nevertheless adopted as a precautionary measure.

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[20] Ann. Chem. (Liebig), 59, p. 300.

[21] Ann. Chem. (Liebig), 142, p. 220.

[22] Arch. Pharm., 1893, 231, p. 613.

[23] I am inkebted to Prof. Kremers for bringing Kunz-Krause's article in the July Berichte to my attention as I read this paper in the August meeting of Am. Phar. Association.—A. B. P.

[24] Berichte, 1897, p. 1617.

[25] Knox and Prescott, loc. cit.

[26] Allen: Com. Org. Anal. III, pt. I., p. 76.

[27] To prevent the formation of the colored body, which would otherwise appear.

The tannin residue in the distilling flask is a porous, pinkish mass, very friable, and easily and completely soluble in water. It is redissolved in a convenient quantity of saturated salt solution, filtered if need be and again shaken out with ethyl acetate, which is distilled off in the way just described. The tannin residue is next dissolved in cold distilled water and shaken out as before, this process being repeated once or twice. The final tannin residue, after the ethyl acetate has been removed as far as possible by distillation, is treated in the flask with a small quantity of ether, which after thoroughly permeating the mass is removed by distillation, using only the partial force of the pump and gentle heat. This is repeated several times until the mass has no odor of ethyl acetate. Then transferring to a vacuum desiccator the tannin is kept for several days over sulfuric acid. If this does not remove the last traces of ether, gentle heat (60°–65°) will do so.

We desire to take this means of expressing our appreciation of the liberality and courtesy of the firm of Frederick Stearns & Company, Manufacturing Pharmacists, Detroit, Michigan, who supplied us with a large quantity of True African Kola nuts, for our research this year. The drug was quite fresh and in perfect preservation, very necessary conditions for work of this kind.

Properties of Kolatannin.

Kolatannin is a cream-colored powder with a slight pinkish tinge. It is freely and completely soluble in water, alcohol, acetone, ethyl acetate, sparingly soluble in ether, insoluble in chloroform and in benzin. The following tabulated comparative statement of its reactions will serve to point out some of the important differences between it and gallotannic acid, and to indicate the close resemblance between this tannin and that of oak bark.

Reactions of Tannins.

	Kolatannin. Free.	Kolatannin. From caffein kolatannate.	Oak Tannin. (Trimble).	Gallotannic Acid.
Ferric acetate.	Green.	Green.	Green.	Blue-black.
Potassium dichromate.	Dark brown ppt.	Dark brown ppt.	Brown ppt.	Brown ppt.
Chlorin.	Pale ppt.	Pale ppt.	....	....
Bromin.	Light yellow ppt.	Light yellow ppt.	Yellow ppt.	No ppt.
Calcium hydroxid.	Pink, then red, changing to ppt.	Pink, then red, changing to ppt.	Red, changing to ppt.	Darkens with bluish tinge, then ppt.
Tartar Emetic.	No ppt.	No ppt.	White ppt.	White ppt.
Quinin. Cinchonin. Caffein.	White ppt.	White ppt.	Ppt.	White ppt.
Albumen.	Ppt.	Ppt.	Ppt.	Ppt.
Lead acetate.	White ppt.	White ppt.	White ppt.	White ppt.
Ammoniacal potassium ferricyanide.	Deep red.	Deep red.	....	Deep red.
Solution of formaldehyde with a condensing agent, as HCl.	Pink ppt., becoming red.	Pink ppt., becoming red.	....	....

(To be continued.)

Victor Meyer.

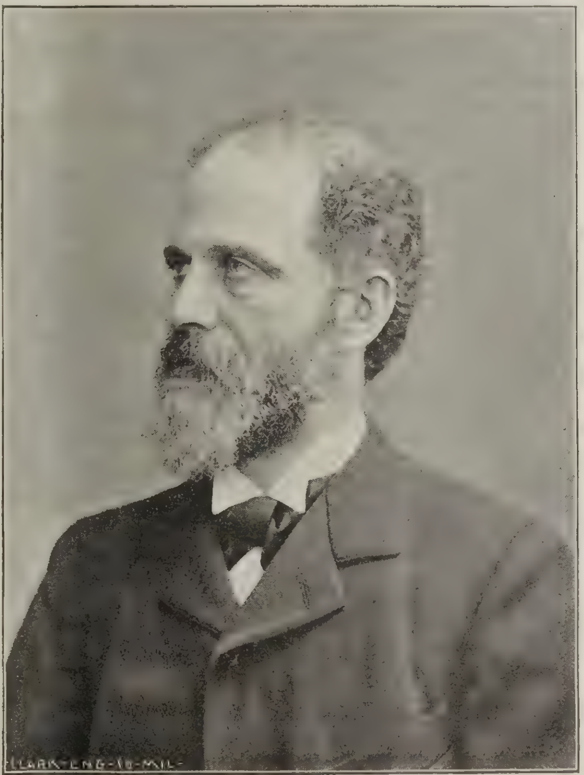
By *H. W. Hillyer.*

The subject of this sketch was born Sept. 8, 1848, at Berlin. He studied at Berlin and Heidelberg under Bunsen and Baeyer. In 1867 he became assistant to Bunsen and was made professor of chemistry at the Polytechnic School at Stuttgart in 1871 and at the Polytechnic School at Zürich in 1872. In 1885 he was advanced to be professor at Göttingen and in 1889 was appointed successor to Bunsen in Heidelberg.

These are the main outward events in the life of Victor Meyer, one of the most successful and notable of recent chemists. His scientific career is even more full of a succession of triumphs due to his energy and skill. With a knowledge of this victorious progress we can hardly receive with credulity the news that comes, that he is dead and by his own hand.

In a hasty review of his scientific career many things must be omitted and many things not given their proportional weight, but we can make no mistake if we try to indicate in some measure the great energy, skill and versatility which have characterized it.

Hardly a volume of that great chemical review, the Chemisches Centralblatt, can be taken up of a date later than 1869 which does not contain abstracts of from one to a dozen articles by him, ranging throughout the field of chemistry from organic to physical chemistry and from analytical to didactic chemistry, and all showing his rare energy, patience and ingenuity.


CLARK-ENG-CO-MIL.

Prof. Victor Meyer.

By the study of the disubstitution products of benzene, published in 1870 and 1871, he gave to the benzene theory of Kekulé one of its firm foundation stones. His studies on the nitro compounds of the fatty series were of great interest, as showing the great influence on the chemical character of a substitution product, of the position in the molecule of the group substituted.

In 1876 he is engaged in studies on the vapor densities of high boiling substances and in this connection he devised those methods and pieces of apparatus most familiar to us as elementary students; Victor Meyer's vapor density method having, for practical every day work, expelled from use every other method. While studying in so wide a field, his interest in a problem taken up seems never to have left him and we find him returning to the earlier problems in later years, as he finds new light on them or as he finds assistants best fitted to fill out the details of the main problem previously solved. So we find several articles in different years on vapor densities and finally find the main idea involved in this method employed by him for a very different purpose, the determination of high temperatures.

In 1876 we find him publishing articles on Valence, on azo-compounds, on nitro-compounds of the fatty series, on oil of turpentine and on pseudo nitrols. In 1879 he writes on furfurol in commercial glacial acetic acid and on the vapor densities of inorganic compounds. By the last mentioned research and others in the same line he shows the dissociation of the halogens at a high temperature and proves that quite a number of metals have at a high temperature but one atom in the molecule.

Some observations made by him at Zürich in 1882 led to one of his most characteristic researches. He noticed that benzene from benzoic acid, when shaken with isatine and sulphuric acid, failed to yield the indopherin reaction, differing in this respect only from the ordinary benzene from coal tar. It had been supposed that the reaction took place between the isatine and the benzene, but here pure benzene from one source gave the reaction and benzene from another source and supposed to be pure did not give the reaction. Was there in either sample an impurity which caused the union to take place between the benzene and the isatine? or was there in coal tar benzene a substance of properties so similar to those of benzene that its presence had not been suspected and did this react with the isatine to give the color? By shaking the coal tar benzene with cold sulphuric acid, he extracted from it a substance unsuspected before and by research found a means of isolating it in pure form. It was an organic sulphur compound with physical and chemical properties strangely similar to those of the hydrocarbon benzene. By investigating its properties and making its derivatives he established its constitution and gave to the chemical world an entirely new series of compounds which he called the thiophene series.

In later years he was largely engaged in the study of slow combustion, especially in determining whether or not there is any definite temperature below which oxygen will not unite with hydrogen or carbon monoxide. In this work he shows his wonderful patience and power of overcoming difficulties. He was also engaged in investigating the iodo and iodoso compounds and in work on organic nitrogen derivatives with a view of explaining certain peculiar isomerisms and of supporting his theories in regard to the stereochemistry of nitrogen.

The latest line of research, on which he has published papers, is on the influence of the position of substituted groups on the ease with which the acids derived from benzene from esters. The interesting result is reached that many groups in ortho position to the carboxyl absolutely prohibit the formation of esters by the action of alcohol and hydrochloric acid.

Among the researches mentioned there are several which may be called classical and which would deserve to yield renown to any chemist. They are full of insight, ingenuity and force, they are suggestive and satisfying, and as we think of the vitality displayed in them, we again find ourselves incredulous when we hear that he is gone.

Quite recently, according to the Heidelberg correspondent of the Pharmaceutische Zeitung, it had been observed by those about him that Professor Meyer's mood had changed, that he was irritable and nervous. He was troubled by insomnia and inability to throw off the cares of his work. He had also been under treatment for nervousness. It is therefore probable that his great suffering led to his death and not any domestic trouble, as has been reported by the papers. He left no letters, but in his last lines written he took most affectionate leave of his wife and children.

MONTHLY REVIEW.

Annual Reports.

A Resume of Progress in the Chemistry of the Carbohydrates during 1896.*

By *W. E. Stone.*

The effect of basic lead acetate upon sugar solutions has been carefully studied, and a number of important conclusions drawn, mostly of technical application: among these, that the presence of basic lead acetate affects the rotation of sugar solutions, through the formation of lead compounds. In the presence of baryta, strontia, or lime, lead saccharates are precipitated; magnesia is also efficient in this respect. Raffinose[1] is thrown down from aqueous solutions by very basic lead acetate.

In an address on the origin of sugar in the beet, F. Strohmer reviews in an interesting manner the physiology of the sugar-beet. The total amount of water and sugar present during the latter half of the growth of the beet is practically constant; the sugar is prepared in the leaf and its amount depends on the vigor and extent of this part of the plant. When removed from the earth, the beet steadily loses sugar by the process of transpiration.[2] Sucrose is said to be formed from the starch in potatoes by freezing (see Starch).

A new method for recovering sucrose from beet-molasses has been patented by G. Kassner.[3] After treatment with lime or basic acetate of lead, the filtered solution is slightly warmed and treated with a thin paste of lead oxide or hydroxide, which precipitates the sucrose as a lead compound. One molecule of sugar requires somewhat more than two molecules of lead oxide, PbO. The lead saccharate is sufficiently insoluble to permit of washing, and is afterwards decomposed by carbon dioxide. The lead carbonate is recovered by ignition. Criticisms of this process, both pro and con, have been published.[4] It does not appear that with proper manipulation there is danger of any lead compounds remaining in the crystallized sugar.

Another patent relating to the same process involves treatment of the molasses with alkali or calcium sulphite and sulphur dioxide, and heating to boiling under pressure.[5]

Amorphous Carbohydrates.

Cellulose.—The valuable researches of Cross and Bevan and their associates upon the constitution of the celluloses is still progressing and with notable results. Reports from these authors during the past year have reference mainly to the cellulose of cereal straws. By dissolving bleached straw-cellulose in concentrated sulphuric acid, and then diluting with water, a precipitate was obtained which was practically free from substances yielding furfurol; the soluble portion retained practically all of such materials originally present in the straw. On neutralizing this solution with barium carbonate, a portion of these materials was thrown down, but the solution still reduced Fehling's solution strongly; the osazone derived from it melted at 154°; analysis indicated a substance with C_{16} to C_{18}; by oxidation acetic acid was produced, and there was evidence of the presence of hydroxyl groups capable of acetylization. The cereal straws are made up of the following constituents: Ligno-celluloses, 33 percent; resistant celluloses, 25 percent; hemi-celluloses, 21 percent; pentosans, 21 percent.[6]

An attempt to trace the development of the various celluloses and related substances in the growing plant (barley) has given interesting results.[7] Substances yielding furfurol were found in both the soluble and the permanent tissue, but these are localized in the cell-substances, and are generally changed into permanent tissue. In the growing plant the "furfuroids" are separated from the cellulose by 1 percent sulphuric acid at a pressure of three atmospheres. In the early stages of growth the "osazones" melt at 180°—190°, i. e., are not pentose compounds. Up to the flowering period the products of hydrolysis are fermentable, and do not yield carbon dioxide when oxidized with hydrogen peroxide. From the flowering period on there is no constant increase of the pentosan-formal complex.

From the mature straw the portion separable by sulphuric acid has the empirical formula $C_6H_{10}O_5$, and probably the constitution of a pentosan-formal,

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* Continued from p. 157.

[1] H. Suoboda: Zeitschr. Ver. Rübenzuck.-Ind., 1896, p. 107.

[2] F. Strohmer: Oesterr.-Ung. Zucker-Ind. u. Landw., 25, p. 589.

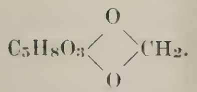
[3] G. Kassner: Ibid., 25, p. 800.

[4] See A. Wohl: Ztschr. Ver. Rübenzuck.-Ind., 1896, p. 159; "C. W.," Dingler's Pol. J., 301, p. 46; G. Kassner: Ibid., 301, p. 215; Pharm. Cent. H., 37, p. 4.

[5] K. Kastengren, Boehm: Ztschr. f. Zuck.-Ind., 20, 279.

[6] Cross, Bevan and Beadle: J. Am. Chem. Soc., 18, p. 16.

[7] Ibid., p. 8; Cross and C. Smith: Chem. News, 74, p. 175; Ber. d. chem. Ges., 29, p. 1457.



It yields the "osazones" of the pentoses after hydrolysis, is characteristically decomposed with formation of carbon dioxide, and the product of hydrolysis is partially fermentable. The authors regard the furfurol-yielding substances as direct products of assimilation.

Former experiments upon the rise in temperature of cellulose through the absorption of atmospheric moisture[8] have been continued, the results indicating that "viscoid," a form of cellulose precipitated from solutions in alkali and carbon disulphide, behaves in this respect like finely divided cotton.[9]

Experiments upon the saccharification of sulphite-cellulose and sawdust, for the purpose of producing alcohol[10] by the fermentation of the product, showed that 0.4 to 0.6 percent sulphuric acid acting at eight atmospheres pressure during two hours produce 45 percent of sugar from sulphite-cellulose. 0.5 percent sulphuric acid at nine atmospheres pressure during one-fourth hour produced 22.5 percent sugar from sawdust. From 100 parts of sawdust, 6.5 parts of pure alcohol were obtained. A tetranitrocellulose of marked explosive properties has been prepared by the action of nitric acid on dinitrocellulose in the presence of strong dehydrating substances like sulphuric acid and phosphorus pentoxide.[11]

Certain cellulose derivatives give promise of such industrial value as to warrant the securing of patents by their originators. Cross and Bevan have patented in England and Germany a process for preparing cellulose tetracetate by heating dehydrated cellulose and zinc acetate with acetyl chloride. The product is solid, but dissolves in chloroform and resembles collodion without possessing its explosive character.

Chardonnet and Lehner have patented in Germany a method of making an imitation of silk ("Glanzcellulose"). A description[12] states that the glistening appearance is due to the fact that the fibres are solid. It is produced by nitrating cellulose, dissolving in alcohol and ether, passing the viscous mass through fine holes, and allowing the solvent to evaporate; the fine threads are spun to yarn, and denitrated by ammonium sulphide, after which it is no longer explosive or combustible. The silk is more hygroscopic than ordinary cellulose, and less elastic, and only 70 percent as strong as silk.

An oil- and water-proof paper has been patented by E. Schering. It is prepared by saturating hydrocellulose (parchment paper) with pyroxylin.

The hemicellulose of the thickened cotyledons of seeds of lupine previously shown to yield galactose and a pentose on hydrolysis, has been studied during the process of germination and is found to be largely absorbed. It undoubtedly serves as a reserve material in the seed.[13]

Analysis of xylan carefully prepared from corn-cobs and dried by a special method, shows its composition to be represented by the formula $C_5H_8O_4$. A similar preparation from birchwood gave the formula $C_4H_6O_3$. It is suggested that this is a tetrosan and further study is reserved. Mannan from vegetable ivory has a composition represented by $C_6H_{10}O_5$.[14]

Starch.—A study of the progressive hydrolysis of starch by acids, controlled by frequent determination of rotation and reducing-power, shows a constant relation between these two properties at all stages of hydrolysis.[15] The conclusion is drawn that in any acid converted starch product the specific rotation represents a definite composition, and in such a product but three simple carbohydrates exist. The speed of hydrolysis follows about the same law as sucrose.

The starch of potatoes which have been frozen or kept for some time at a temperature near the freezing-point, is changed to sugar (sucrose and dextrose). If such potatoes are returned to ordinary temperature, in time some of the sugar disappears in the process of transpiration, and a large portion (about 62 percent) is changed back to starch.[16]

Starch paste is changed by chloroform into modifications similar to those produced by the action of acids. A solution of starch in contact with chloroform for three months no longer gave the usual reaction with iodine. By evaporating the solution and precipitating with alcohol, dextrins of varying solubility were obtained.[17]

Iodine and starch form a chemical compound, e. g., starch is able to withdraw iodine from other compounds, forming iodide of starch. From the latter compound the iodine is separated by dialysis in the form of hydriodic acid.[18]

Starch exposed to a solution of chloral swells up to a nearly clear, viscous solution. After filtration such a solution gives no color reaction with solid iodine: if water be added to this solution, a blue color appears at the zone of contact with the iodine. These and other reactions show a restrictive influence of chloral on the formation of the starch-iodine compound.[19]

The isomaltose of Lintner and Düll, and others, is still regarded as of doubtful existence. Among the products of diastatic action upon starch, isomaltose is said to be formed. It is pointed out that different dextrins result, of which the so-called No. III resembles maltose, but is not easily fermented by yeast of the Saaz or Frohberg types, these properties being characteristic of isomaltose. If, however, the experiments be made *in vacuo*, this product is readily fermentable. This is explained on the principles of osmosis, fermentability being dependent upon the diffusibility of the substance through the cell-membrane. Moreover, this dextrin III, if mixed with about 20 percent of maltose, gives an "osazon" like that described for isomaltose. The author regards isomaltose as a mixture of maltose and certain dextrins.[20]

Isomaltose may be prepared by the action of sulphuric acid on dextrose at ordinary temperature for some months. By precipitation with alcohol and ether, about 27 percent of the original sugar was obtained as a product of a specific rotation of +70° and a reducing-power two-thirds that of dextrose. In a similar way maltose may be condensed to isomaltose.[21]

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[8] Chem. News, 71, p. 1.
[9] C. Beadle and O. Dahl: Chem. News, 73, p. 180.
[10] E. Simonson: Norsk. tekniks. Tidskrift, 1895, p. 65.
[11] H. N. Warren: Chem. News, 74, p. 239.
[12] Cross and Bevan: J. Soc. Chem. Ind., 15, p. 317.
[13] E. Schultze: Ztschr. phys. Chem., 21, p. 392.
[14] S. W. Johnson: J. Am. Chem. Soc., 18, p. 214.
[15] G. Rolfe and G. Defren: Ibid., 18, p. 869.
[16] W. Bersch: Oesterr.-Ung. Ztschr. Zuck.-Ind. u. Landw., 25, p. 766.
[17] F. Musset: Pharm. Centr. H., 37, p. 587.
[18] Ibid., 37, p. 556.
[19] E. Schaer: Pharm. Centr. H., 37, p. 540.
[20] E. Prior: Centr. Bl. f. Bakt. u. Parasitenkund., 2, p. 271; also Forsch: Ber. ub. Lebensm. u. Bez. Z. Hyg., 3, p. 322.

Action of Ferments.

The action of animal secretions on the polysaccharides has been studied under a wide range of conditions and with many different materials, including blood serum and infusions from various glands and organs of different warm- and cold-blooded animals. In all cases starch, glycogen and maltose were changed to dextrose. Lactose was not changed by blood serum nor was sucrose. In general, the latter was but little affected. Trehalose was slightly changed in some cases, in others not. Raffinose was unchanged by either blood serum or intestinal juices; α-methyl-glucoside was unchanged, but methyl-glucoside was decomposed by an infusion of the intestinal membranes of the horse. Amygdalin was unchanged by the intestinal infusion of ruminants, but speedily decomposed by that of other mammals.[22]

Experiments indicate that a sugar not fermentable by a certain organism is still unfermentable when mixed with a second fermentable sugar.[23]

By extracting cultures of *aspergillus niger* with water, a soluble ferment is obtained which produces very complete hydrolysis of raffinose, the rotation diminishing from 103° to 50°. An infusion of baker's yeast gave similar results.[24]

Brown and Morris have called attention to an enzyme (cystase), which dissolves cellulose, but is rendered inactive at 60°.

Other enzymes are thought to exist, which are able to hydrolyze the hemicelluloses, such as arabo-xylan, galacto-araban, etc., but at temperatures below 60°.[25]

A saturated solution of gypsum seems to retard diastatic action temporarily, but, later, saccharification is increased.[26]

Chemistry.

Sodium ossalinate.

This is the name given to the sodium salt of the fatty acid produced from beef-marrow. According to the manufacturer, J. E. Stroschein, it is intended as a substitute for cod-liver oil.

[Ph. Ztg., 1897, p. 354.]

Bromalbumin.

Under the name of "Bromosin" this compound has come into use since 1895, and in reference to it Professor O. Loew states that after removing loosely adherent bromine there remains 16.16 per cent. in a more intimate state of combination. After solution in ammonia and precipitating, there remains 13.10 per cent. bromine. On boiling bromalbumin with alkali, sulphur is not abstracted as in the case of ordinary albumin, and no tyrosin is formed by treatment with mineral acids. Millon's reagent does not produce a red coloration on boiling, though the biuret reaction takes place distinctly. Albumin which has been subjected to partial oxidation by treatment with potassium permanganate behaves in a similar manner, so that the groups affected by bromine are probably the same as those affected by incipient oxidation.

[Chemiker Zeitung, 1897, p. 264.]

Caffeotannic Acid.

In 1867 Hlasiwetz showed that caffeotannic acid upon hydrolysis yielded an uncrystallizable sugar and a then unknown acid which he called caffeic acid and which proved to be dioxycinnamic acid, $C_6H_3(OH)_2.CH:CH.COOH$. Later (1884) A. W. v. Hofmann isolated the same acid from the motherliquids resulting in the preparation of coniine. Several years ago H. Kunz-Krause obtained the same acid from the matétannic acid upon hydrolysis of the latter according to Hlasiwetz's method, thus demonstrating the identity of both so-called tannic acids. For this group of glucosoid compounds the author suggested the group name glycotannoids. He now points out that the melting point of caffeotannic acid given by Hofmann, viz. 213°, is not its melting point, but its decomposition point. Like the other aromatic hydroxy acids it gives off its carboxyl carbonatom as carbonic acid at 200°. As second decomposition product vinylpyrocatechol (m-p dioxystyrol): $C_6H_3(OH)_2.CH:CH_2$ 1:3:4 (.CH:CH₂ in 1), which was unknown heretofore, results. This vinylpyrocatechol, however, does not distill without decomposition even in vacuum, but breaks up quantitatively into pyrocatechol.

[Berichte, 30, p. 1617.]

On the Action of the Galvanic Current on Several Alkaloids.

E. Schmidt and H. Pommerehne have examined the action of the electric current on dilute acid solutions of several alkaloids. Caffeine yielded amalinic acid, formic acid, ammonia and methylamine. The primary reaction is expressed by the following equation:

$$\underbrace{2C_8H_{10}N_4O_2}_{\text{Caffeine}} + 5H_2O + 3O = \underbrace{C_{12}H_{14}N_4O_6}_{\text{Amalinic Ac.}} + 2NH_3 + 2NH_2.CH_3 + 2CO_2.$$

Inasmuch as no CO_2 was eliberated, it is supposed that this was secondarily reduced by the nascent hydrogen to formic acid.

From an acid solution of morphine after similar treatment only oxydimorphine has been obtained thus far.

A like solution of quinine yielded only a green resinous substance resembling thalleiochine.

[Arch. f. Pharm. 235, p. 364.]

The Alkaloids of the Lupines.

Prof. E. Schmidt and his pupils continue their interesting reports on the alkaloids obtained from these forage and decorative garden plants. (See this journal, p. 138.) The names of the authors, the titles of the several articles and only a few of the quantitative results can be mentioned here. For the detailed study of the alkaloids and their salts the originals will have to be consulted.

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[21] H. Ost: Chem. Ztg., 20, p. 761.

[22] E. Fischer: Sitzungs-Ber. Kgl. Preuss. Akad. d. Wiss., Jan., 1896; also E. Bourquelot and E. Gley: Compt Rend. Soc. Biol., 1895, p. 555.

[23] Van Laer: Bull. Assoc. belge. Chimistes, 9, p. 319.

[24] E. Bourquelot: J. Pharm. Chim. (6), 3, p. 390.

[25] J. Grüss: Wchschr. Brauerei, 1895, p. 1257.

[26] J. Grüss: Berl. Pharm. Ges., 5, p. 258.

L. Berend: — Ueber das Lupinin und das Lupinidin der gelben Lupine, p. 262.

K. Gerhard: — Ueber die Alkaloide der schwarzen Lupine, p. 342.

K. Gerhard: — Ueber die Alkaloide der perennirenden Lupine, *Lupinus polyphyllus*, p. 355.

K. Gerhard: — Notiz über die Alkaloide der Samen von *L. affinis*, *L. albo-coccineus*, *L. Cruikshanksi*, *L. Moritzianus*, *L. mutabilis*, *L. pubescens*, p. 363.

The assay according to Keller's method yielded the following results:

The quantity of alkaloids obtained from 100.0 seeds required for neutralization, $\frac{N}{10}$ sulphuric acid being used:

Yellow lupine	18.12 ccm.	= 0.4493 p. c.	= 0.6378 p. c.
Blue lupine	29.23 “	= 0.7249 “	= — “
White lupine	44.82 “	= 1.1115 “	= — “
Perennial lupine	47.70 “	= 1.1829 “	= — “
Black lupine	24.60 “	= 0.6100 “	= 0.8659 “

Inasmuch as it was ascertained later that the black lupine contains a third alkaloid, lupinidine, $C_8H_{15}N$, the amount of which could not be definitely determined, the assay of this variety has but a relative value.

An assay of the varieties mentioned in the third paper was made according to the same method. The amount of acid ($\frac{N}{10}H_2SO_4$) for the alkaloids from 10.0 of seed was ascertained. The percentage calculated is that for lupanine.

L. affinis	22.3 ccm.	= 0.55304 p. c.
L. albo-coccineus	34.9 “	= 0.86552 “
L. Cruikshanksi	53.6 “	= 1.32928 “
L. Moritzianus	31.8 “	= 0.78864 “
L. mutabilis	47.4 “	= 1.17552 “
L. pubescens	52.9 “	= 1.31392 “

What the exact nature of the alkaloids in these varieties is has not yet been ascertained.

A. Soldaini, who had also begun the study of the alkaloids of *Lupinus albus*, reports (p. 368) on the results of his investigations which accord largely with those of E. Schmidt and his pupils. He describes several of the alkaloids and their salts and also comments somewhat on the chemical structure of their molecules, without, however, assigning any definite structural formulæ. He also mentions briefly the physiological and therapeutic investigations on the part of Profs. Gabbi and Gaglio; also the study of the action of mould on these alkaloids by Prof. Eerni. Further publications from all of these sources are to be expected.

[Arch. f. Pharm. 235, pp. 262, 342 & 368.]

The Distribution of Alkaloids.*

Rutaceæ. a) *Ruteæ.*

Angusturine, $C_{10}H_{40}NO_{14}$ (?), Cusparia trifoliata Engler (Galipea officin. Hancock).
Evodine, $C_6H_{18}NO_6$ (?), “
Cusparine, $C_{20}H_{19}NO_3$, “
Cusparidine, $C_{19}H_{17}NO_3$, “
Galipeïne, $C_{20}H_{21}NO_3$, “
Galipidine, $C_{19}H_{19}NO_3$, “
Harmaline, $C_{13}H_{14}N_2O$, Peganum Harmala.
Harmine, $C_{13}H_{12}N_2O$, “ “
Pilocarpine, $C_{11}H_{16}N_2O_2$, Pilocarpus pennatifolius.
Pilocarpidine, $C_{10}H_{14}N_2O_2$, Pilocarpus pennatifolius.
Jaborine, $C_{22}H_{32}N_4O_4$, “ “

b) *Xanthoxyleæ.*

Artarine, $C_{21}H_{23}NO_4$ (?), Xanthoxylon senegalense.
Berberine, $C_{20}H_{17}NO_4$, “ caribæum.
Xanthoxyline, —, “ carolinianum.

Sarraceniaceæ.

Sarracenine, —, Sarracenia purpurea.

Simarubaceæ.

Pereirine, —, Picramnia ciliata Mart.
Picramnine, —, Cascara amara.

Solanaceæ.

Atropine, $C_{17}H_{23}NO_3$, Atropa Belladonna, Datura Stamonium.
Atropamine, $C_{17}H_{21}NO_2$, Atropa Belladonna.
Belladonnine, $C_{17}H_{21}NO_2$ (?), “
Oxytropine (?), $C_8H_{15}NO_2$, “
Pseudotropine, $C_8H_{15}NO$, “
Betaïne, $C_5H_{15}NO_3$, Lycium barbarum.
Capsicine, —, Capsicum annuum.
Choline, $C_5H_{15}NO_2$, Atropa Belladonna, Hyoscyamus niger, Fabiana imbricata, etc.
Grandiflorine, —, Solanum grandiflorum, var. pulverul.
Hyoscyamine, $C_{17}H_{23}NO_3$, Atropa Belladonna, Datura stramonium and Hyoscyamus niger.
Mandragorine, $C_{17}H_{23}NO_3$, Mandragora officinalis.
Nicotine, $C_{10}H_{14}N_2$, Nicotiana tabacum.
Nicotianine, $C_{23}H_{32}N_2O_3$ (?), “ “
Scopolamine, $C_{17}H_{21}NO_4$, Scopolia atropoides, Duboisia myoporoides, Atropa Belladonna, Datura Stramonium.
Somniferine, —, Withalia somnifera.
Solanine, $C_{43}H_{71}NO_{16}$ (?), Solanum tuberosum, S. ferox, S. nigrum.
Solaneïne, $C_{52}H_{83}NO_{13}$ (?), Solanum tuberosum.

Sterculiaceæ.

Theobromine, $C_7H_8N_4O_2$, Theobroma Cacao.

Styracaceæ.

Loturine, —, Symplocos racemosa Roxb.
Colloturine, —, “ “
Loturidine, —, “ “

Ternstræmiaceæ (*Camelliaceæ*).

Caffeïne, $C_8H_{10}N_4O_2$, Thea chinensis.
Theophylline, $C_7H_8N_4O_2$, “ “

Umbelliferæ.

Chærophylline, —, Chærophyllum bulbosum.
Cicutine, — Cicuta virosa.
Coniine, $C_8H_{17}N$, Conium maculatum.
Methylconiine, $C_8H_{16}(CH_3)N$ “ “
Conhydrine, $C_8H_{17}NO$, “ “
Pseudoconhydrine, $C_8H_{17}NO$, “ “
Cynapine, —, Aethusa Cynapium.
Oenanthine, —, Oenanthe fistulosa.
Pastinacine, —, Pastinaca sativa.

Urtiaceæ. a) *Urticeæ.*

Unknown, —, Urtica urens and U. diœca.

b) *Cannabineæ.*

Cannabinine, —, Cannabis indica and C. sativa.
Hop-alkaloids, —, Humulus Lupulus.

Verbenaceæ.

Viticine, —, Vitex Agnus castus.
Castine, —, “ “ “

Violaceæ.

Anchietine, —, Anchietea salubris.
Violine, —, Viola odorata.

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* Continued from p. 160.

The Present State of the Scopolamine-Hoscine Question.

In a paper presented by Dr. Louis Merck to the New York section of the Society of Chemical Industry, the author presents the question as it now stands. In speaking of the socalled amorphous "hyoscyamine", the mixture of bases obtained from hyoscyamus seed, the author said that Ladenburg had first isolated from it a principle which he named hyoscine. Ladenburg considered this base to be an isomer of atropine and hyoscyamine and assigned to it the formula $C_{17}H_{23}NO_3$. Hesse on the other hand claimed this base to have the composition $C_{17}H_{21}NO_4$ and to be identical with that isolated from Scopolia atropoides by E. Schmidt and named scopolamine. Later E. Schmidt found that commercial hydrobromate of hyoscine consisted almost entirely of scopolamine hydrobromate, although he does not on this account claim the nonexistence of a hyoscine of the formula $C_{17}H_{23}NO_3$, but is rather of the opinion, that a base of this composition might be found in the mixture of alkaloids obtained from the Solanaceae and that Ladenburg really obtained this base in the course of his investigation.

According to Dr. Merck the hyoscine put on the market by E. Merck is in all respects identical with scopolamine, and it is only to prevent mistakes in commercial circles that this firm has designated in its lists the alkaloid from hyoscyamus as "hyoscine" and that from Scopolia atropoides as "scopolamine".

Since the beginning of this question the firm of E. Merck, which uses large quantities of drugs of the Solanaceae for the production of alkaloids, has continually made efforts to isolate a base of the composition $C_{17}H_{23}NO_3$, and which posseses the properties of hyoscine, but without success. They obtained from Duboisia myoporoides a base $C_{17}H_{23}NO_3$, the properties of which are however quite different from those of hyoscine, the former is, for instance, a crystalline compound melting at 132°—134°, whereas the latter is an oily fluid. This base from Duboisia myoporoides they claim to be isomeric with atropine and hyoscyamine and called it "pseudo-hyoscyamine".

Even by investigating large quantities of the alkaloidal residues obtained in the manufacture of atropine they have not been successful in isolating a base comparable with hyoscine of the formula $C_{17}H_{23}NO_3$. Repeated attempts were made to isolate all the alkaloids from Duboisia. The bases obtained were hyoscyamine, hyoscine (=scopolamine) $C_{17}H_{23}NO_3$, speudohyoscyamine, and considerable quantities of amorphous bases. Never was a base found which corresponded to the formula and properties of the hyoscine of Ladenburg, nor have they been able to find hyoscine (=scopolamine) in hyoscyamus seed and scopolia root. Dr. Merck questions very much whether it be indeed possible to isolate the hyoscine of Ladenburg from any of the known Solanaceae, and therefore considers the present question simply as a controversy between O. Hesse and E. Schmidt as to whether the alkaloid $C_{17}H_{21}NO_4$, should be called scopolamine or hyoscine.

Calcium carbide and Melting and Distillation of Metals.

Joh. Pfleger of Frankfort gave a detailed report of the calcium carbide industry at the fourth annual meeting of the German Electrochemical Society, held at München. He pointed out that only since the production of calcium carbide the varied uses of electrical heating had been recognized, and to such an extent that at present we may speak of a chemistry of the arc lamp. Up to the present time Moissan has been almost exclusively the only investigator along this line and the German scientific institutions have scarcely furnished a single report of an investigation. This is evidently due to the fact that the German laboratories have not the facilities of obtaining the large currents that Moissan employs. After a critical account of the various attempts to increase the production of the carbide furnaces, the speaker said that perhaps the only point in which the structure of the furnace might be modified so as to give a greater yield, consisted in warming the raw material by the use of the large quantities of carbon monoxide which escape in the process. The quantity of this gas given off is very large; two tons of carbide give nearly one ton of carbon monoxide. The speaker then said that Spain was particularly well adapted for carbide factories on account of its many waterfalls, which can be utilized to furnish the enormous amount of energy necessary in the manufacture. The lecturer has inspected several places in the Pyrenees with this object in view and pointed out that the limestone obtainable in the neighborhood would tend to decrease the cost of production. A factory is to be built on the Ebro with a production of 30,000 tons annually. As to the consumption of these enormous quantities of calcium carbide there is in Spain, besides the uses for lighting purposes, also that of annihilation of the lice infecting the grape vines.

The operating of a calcium carbide factory is exceedingly simple. Coke and lime are ground, the coke somewhat finer than the lime and these two mixed in such proportion that the theoretical quantity of calcium oxide is present. This mixture is then fed continually to the furnace. It has been claimed that the lime melts at the temperature of formation of calcium carbide and that it is for this reason that the lime can be used much coarser than the coke. The speaker has found that lime does not melt under the same conditions that the carbide formation takes place, but he has noticed that quite an appreciable quantity is volatilized and deposited as a very soft sublimate. He is therefore inclined to ascribe some part in the formation of carbide to this fact.

The lecturer then showed a furnace for the distillation of metals of high melting points. The furnace is closed and provided with a gas vent, and offers the possibility of a more exact study of the process of reaction in the arc lamp. In order to study the reaction of gases on solids he uses a carbon tube, through which the gas is admitted, as upper pole. In this manner he has distilled several metals in a current of hydrogen. There are formed during this process bad smelling vapors which are probably hydrides of the metals. By conducting chlorine through the hollow carbon it is possible to make readily the chlorides of metals which are otherwise formed only with difficulty. Even carbon appears to react with chlorine at the temperature of the arc lamp. He suggests that by using hydrochloric acid gas it might be possible to get halogen derivatives of hydrocarbons.

Carpaïne.

J. J. L. van Rijn, who published his first observations on this subject in 1893 (Arch. f. Pharm., p. 184), has recently made another interesting report. The carpaïne examined was partly obtained from E. Merck, partly from 500 kg. of dried leaves of *Carica Papaya* L. obtained from India.

The author states that according to Bretschneider this tree was brought to China and the East Indies by the Spanish and Portugese after the discovery of America. The Sinologi, who claim that the papaya tree was previously indigenous to China and known under the name of tree-melon (Mu kua), according to the same authority confuse *Carica Papaya* with *Cydonia Sinensis*.

The physiological action of carpeïne on the heart, according to C. L. Ruemke, differs materially from that of digitalis. It acts paralysing, but apparently directly on the heart muscle without affecting the nerves. Of a cumulative effect nothing definite is known.

It is of interest to note that the natives have learned to deprive the infusion of the leaves of its bitter taste by boiling it with a certain shale. Whereas Vorderman is of the opinion that this is due to a decomposition of the carpaïne, van Rijn holds that the carpaïne is only mechanically removed.

To substantiate the formula of the author, $C_{14}H_{25}NO_2$, analyses by Dr. Greshoff made in the Buitenzorg laboratory in 1891 are published. Methyl carpaïne forms small colorless prisms melting at 71°. A platinum salt was analysed. The action of benzoylchloride on carpaïne, methyl carpaïne and nitroso-carpaïne was studied. A new substance was obtained and more definite data may be expected later. The same is to be said about the products of hydrolysis of the carpaïne and of its oxydation with acid permanganate.

A crystallographic description of carpaïne and some of its salts by Prof. A. Wichmann is also given.

Besides the carpaïne a glucoside, carposid, was obtained by precipitating it with basic lead acetate from the aqueous solution from which the carpaïne had been removed by extraction with ether. This glucoside, however, has no saponin-like characteristics and the author is of the opinion with Greshoff that no such substance occurs in the leaves.

[Arch. f. Pharm. 235, p. 232.]

Cytisine.

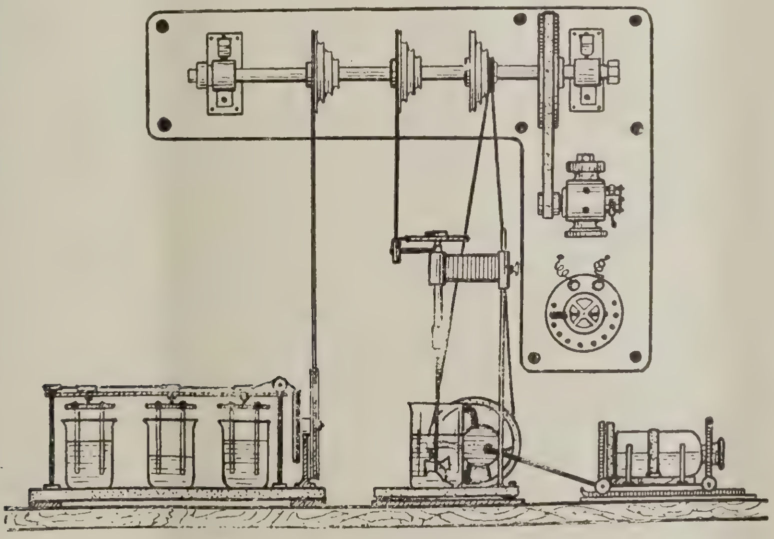
This alkaloid has of late years been examined by a number of chemists and has been shown to be identical with ulexine, $C_{11}H_{14}N_2O$ obtained from the seed of *Ulex europæus*. As to its constitution it has thus far been shown that one of the nitrogen atoms is in form of an imido, NH, group, and that it is somehow related to pyridine.

J. Lammers has undertaken the study of the halogen derivatives of cytisine with the hope of learning more about the constitution of this alkaloid. Although a large number of new compounds were prepared, they have thrown no new light on this question. It had been supposed by Partheil that cytisine is related to nicotine. Lammers, however, shows that the halogen derivatives are much more stable than those of the latter. [Arch. f. Pharm. 235, p. 374.]

Pharmaceutical Technique.

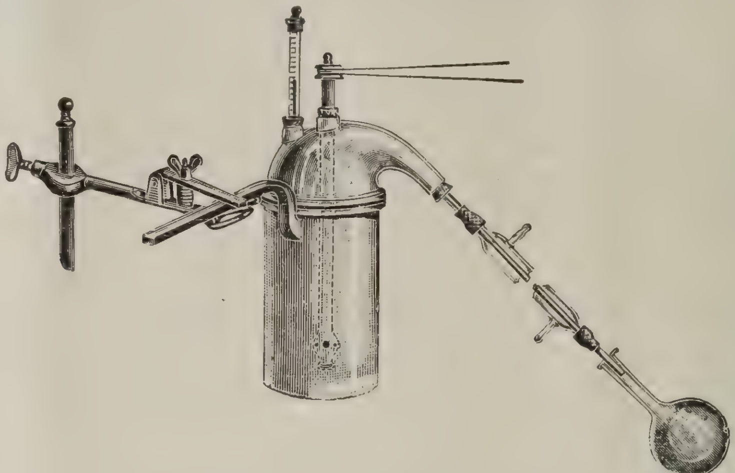
Shaking and Stirring Apparatus.

The accompanying cut illustrates a new shaking and stirring apparatus, put on the market by Max Kaehler and Martini, Berlin. The power is furnished by a small electric motor capable of developing 1/12 horse power, when working on a circuit of 65—110 volts and with a current of 1.2—2 amperes. Attached to the same wall-board with the motor are a resistance box and the hanger with self-oiling bearings, in which the shaft runs. Three cone pulleys fastened to the shaft allow the stirring and shaking apparatus connected with them to be run at variable speed.



Combination Melting, Distilling, and Subliming Apparatus.

This new apparatus, shown in the accompanying figure, was devised by Dr. L. Paul and can be obtained through M. Kaehler and Martini, Berlin. The material of which the apparatus is made is highly resistant "Sanitäts" porcelain. The advantages claimed for it are as follows: The handle at the side permits easy manipulation and also allows the apparatus to be clamped to an ordinary stand. The doubly tubulated head can be employed for introducing a thermometer and stirring apparatus, as shown in the figure, or the openings can be used for distilling with a current of air, in case of sublimation or distillation of substances of high melting point. After the operation is completed, the head, which is fastened on to the body by means of clamps, can be removed, and the apparatus readily cleaned.



Botany and Pharmacognosy.

Hydrocyanic Acid in Pomaceous Seeds.

Kobert*) mentions but one plant of the *Pomaceæ* of which the seeds contain emulsin and amygdalin. M. L. Lutz has studied the seeds of a number of members of this group with reference to these constituents and finds both substances in the seeds of *Malus communis, Cydonia vulgaris, C. Japonica, Sorbus Aucuparia* and *S. Aria*. They were not found together in *Pirus communis, Cratægus oxyacantha, C. Azarolus* and *Mespilus Germanica.*

Emulsin was found to be located in numerous cells scattered through the parenchyma of the cotyledons and especially in the vicinity of woody bundles whose endodermis likewise contains it. It is entirely lacking in the external palisade cells. The hypocotyl, plumule and root do not contain it.

Amygdalin was not precisely located. It is found in the cotyledons, hypocotyl, plumule and root.

Germination does not change the localization of these two substances. [Bot. Gaz. 24, p. 54.]

The Detection of Adulterations in Powdered Drugs.

Dr. H. H. Rusby, as Chairman of Research Committee C of Revision of the U. S. Pharmacopœia, reports the results of important work in the line of methods for detecting adulterations in powdered drugs. The results of a number of investigations by several authors are summed up in a series of concisely stated tests recommended for introduction into the coming edition of the Pharmacopœia.

Usually the distinguishing characteristics to be observed are best seen in very fine powders.

To separate Cartagena ipecac from the official Rio variety, the powder should not exhibit solitary starch grains having a diameter of 16 microms or more and those having a diameter of 12 to 14 microms should be rare.

To exclude chestnut leaves from senna leaves the following method is given. If a thin layer of the powder be placed upon a glass slide laid upon white paper and one drop of a 5 percent solution of ferric chloride be dropped upon it, none of the particles should be blackened within thirty seconds.

To exclude the wild or Bombay mace also curcuma from the official mace, after treatment with potash solution, the powder should not exhibit dark particles which turn yellow upon the addition of sulphuric acid.

To distinguish the flowers of *Sambucus Canadensis* from the flowers of *S. nigra,* the powder should display single, stout, slightly curved, blunt, unicellular hairs and clusters of much smaller, short, crooked multicellular hairs.

To exclude the stem bark of sassafras from the official root bark in a number 60 powder, only thin walled cells are exhibited, almost invariably without pores and well filled with starch grains. Bast fibres are rare, but commonly detached. Starch grains are mostly in groups, the small ones lenticular, occasionally reaching a diameter of 12 to 15 microms.

To distinguish the Surinam quassia from the official Jamaica quassia, in a tangential view none of the medullary rays should exhibit a single row of cells, the latter having a subrotund outline and no stone cells should be present.

The younger form of Eucalyptus leaves is of inferior value and is excluded from the Pharmacopœia. In a fine powder no fragments of epidermis should be found in which the guard cells of the stomata can be distinctly seen in a vertical view, nor any fragments which, without having stomata, exhibit wavy epidermal cell walls in vertical view.

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* Kobert, Lehrbuch d. Intoxicationen, p. 510.

[Drug. Circ. and Chem. Gaz., 1897, p. 185.]

Blue Grass Manna.

R. T. Baker and H. G. Smith describe a true manna found on a "blue grass," *Andropogon annulatus*, Forsk. Its chief constituent is mannite, of which it yields 58 per cent., together with glucose and other sugars. The manna is mostly white, and in general appearance resembles eucalyptus manna. It is sweetish to the taste, not moist, breaks easily into fragments, and feels slightly greasy. [Proc. Roy. Soc., N. S. Wales.]

Bisabol-Myrrh.

Besides the officinal myrrh which is collected in Arabia and along the Somali coast of Africa from several *Commiphora* species there exists another if not several varieties. Little is known about this second variety which is known among the Somali as Habaghadi or female myrrh and among the Arabs as Bisabol (Baisabol, Mhaisabol, from Sanskr.: Mehiska, buffalo and mol, bol myrrh). It is known, however, that most of it comes from the interior of Somali and that almost all of it is taken to India and thence to China. It is also known that its ethereal extract does not give the red color with bromine vapor like the officinal or Herabol-myrrh.

In 1891 Prof. Keller while traveling in Somali purchased, while in the country of the Habar-Junis, a specimen of myrrh from a caravan on its way from Ogadee to the north (Berbera). Last year Prof. Hartwich received this specimen and at his request W. Tucholka examined the drug (abt. 2 Ko.)

The oleoresin contained 22.1 p. c. gum soluble in water; 29.85 p. c. "gum" soluble in soda solution; 21.5 p. c. crude resin; 1.5 p. c. crude bitter principle; 7.8 p. c. volatile oil; 3.17 p. c. water; and 13.4 p. c. plant remnants and inorganic impurities.

The oil is laevogyrate and has a high boiling point, 50 p. c. boiling at about 257°. A dihydrochloride, $C_{10}H_{16}.2HCl$, melting at 79.3°, was obtained. The regenerated hydrocarbon boils at 259—260.3° and, as it appears different from the known terpenes, is called bisabolene. A substance, $C_{56}H_{96}O$, boiling as 230—231° and giving the characteristic reaction of the crude drug was also isolated.

The examination of the resin yielded several amorphous substances which were analysed.

Chemical Constituents of the Root of Baptisia tinctoria R. Br.

This plant is also known as *Sophora tinctoria* L., *Podalyria tinctoria* Michaux, wild indigo and dyer's podalyria, and has found medicinal application in this country. Inasmuch as important therapeutic properties are claimed for its preparations, the root has been repeatedly examined.

Smedley examined it as early as 1862, but Weaver (1871) claimed that Smedley's alkaloid was nothing but calcium sulphate and that he (W.) was the first to prepare an alkaloid. Greene again examined it in 1879, and Schroeder in 1885. The latter obtained baptisin, a bitter glucoside insoluble in water; baptin, a glucoside soluble in water; and baptitoxine, a poisonous alkaloid. Plugge has shown that the alkaloid from the seeds is identical with cytisine so widely distributed in the family of *Leguminosæ*.

At the suggestion of the late Prof. Plugge, K. Gorter has undertaken a detailed study of the root. He isolated the following substances:—

I. Baptisin. This glucoside is lævogyrate and has the formula $C_{26}H_{32}O_{14}$. When hydrolyzed with sulphuric acid it splits up into baptegenin, $C_{14}H_{12}O_6$, and rhamnose (isodulcite), $C_6H_{12}O_5+2H_2O$, taking up four molecules of water. Baptisin is not poisonous to frogs. Various derivatives of baptegenin were prepared and studied.

II. Baptitoxine, which is identical with cytisine. Only 1.2 g. of the nitrate were obtained from 4.1 ko. of root. [Arch. f. Pharm. 235, p. 301.]

Guttapercha in Dutch Guiana.

The Foreign Office has recently issued a report, by Consul Churchill, on the *Balata* industry of the colony of Netherlands Guiana, which is of interest to the Forest Officers of India, as it shows that the list of trees which yield guttapercha or indiarubber is by no means complete.

The Indian Agriculturist for May draws the attention of the Forest Officers to this report, and publishes some interesting remarks as well as extracts from the report in question.

Balata is a kind of guttapercha obtained from the milky juice of the bark of the bully or bullet-tree, *Mimusops balata*, a large forest tree belonging to the order *Sapotaceæ*, which ranges from Jamaica and Trinidad, to Venezuela and French Guiana. Although the tree has been known for years past, its wood, which is very hard, having been largely used for sugar-mill rollers, machinery and building purposes, the collection of the juice for the manufacture of guttapercha is of recent origin, and it is to this point that attention is drawn, as there are probably many trees indigenous to India capable of yielding guttapercha in paying quantities.

The bullet-tree is found (in Netherlands Guiana) in greatest abundance in the low-lying zone of fluviomarine deposit. It also occurs in the higher lands of the interior, but in less abundance and more scattered. In the most suitable localities upwards of twenty or thirty trees of a thickness of twelve to thirty inches may be found within a radius of one hundred feet. Where the tree is less plentiful two or three trees only will be found in the same area. When the thickness of the trunk exceeds thirty inches, the tree is usually not worth bleeding. The juice-gatherer usually discovers the trees from a distance by their foliage, or recognizes his proximity to them by changes in the character of the bush.

The tree often grows in belts or zones, on which it flourishes, dominating all the other trees. The limits of the zones or belts being crossed, the forest may be traversed for hours without a single bullet-tree being met with, after which another zone may probably be entered by the traveller.

It seems that balata is by no means neglected, and would, in fact, find ready purchasers if more came into the market. At present the supply is not only uncertain but very limited.

Balata commands a higher price than guttapercha, and this, in itself, is a proof of its valuable qualities. It is generally used only for special purposes, and the manufacturers treat it simply as a superior kind of guttapercha, and hence, when manufactured, its name disappears.

Nevertheless, balata presents distinct physical differences from guttapercha. It is much softer at the ordinary temperatures and not so rigid when cold. From a chemical point of view, balata, guttapercha and caoutchouc are probably closely allied.

A marked and important difference is exhibited in the behavior of balata under the influence of the atmosphere. When exposed to light and air, guttapercha soon becomes altered superficially and changed into a brittle resinous substance; under similar conditions balata changes but slowly. Dr. Hugo Müller states that a piece of balata tissue which he had in his possession was, after six years, still supple and coherent, although showing a slight mealy efflorescence. A similar piece of guttapercha tissue would have become brittle and resinous long before that time had elapsed.

The insulating qualities of balata, from an electrical point of view, are said to be quite equal to those of guttapercha, so that a sufficient and constant supply, and a somewhat lower price, are the only conditions now necessary to make the industry a complete success.

The balata industry in the colony is still in its infancy. In Surinam, the forests which have been bled are abandoned and new lands are being sought for and exploited. Only those areas where an abundance of trees is to be found have been selected. The forests are all Crown property and are leased to the Colonial Government, for the exploitation of balata only, at a rental of 10c. per hectare per annum. There is no export duty whatever.

The "juice-gatherer" receives about 50c. to 55c. per pound, a gallon of the "milk" usually yielding about four pounds of balata. The average yield in Surinam is one gallon per tree. Incisions are made from the base to a height of twenty feet and the bark is scarified over half its circumference; further scarification is illegal. An average gatherer will obtain about four gallons per day; but as much as ten gallons may be obtained in the same time by a very successful workman. Upwards of a thousand men, chiefly recruited from Berbice, in British Guiana, are employed in the colony in the balata industry.

The hot and wet seasons are unsuitable for the gathering. The trees blossom in August, and the seed drops during November, when the leaves shoot. Toward the end of January the juice attains the condition in which it runs most plentifully. It sometimes happens that a tree does not yield juice when the gatherer visits it, and under the present conditions of cultivation it is not profitable to return later when the juice would be ready. Considerable loss arises in this manner. The flow of "milk" during the flowering season is not sufficient to pay for the cost of collection. Work ceases about the end of August, and is resumed during the middle of January.

Balata cannot be purchased in the market of Paramaribo. It is only gathered for those who employ "Balata Bleeders"; hence, quotations as to price are not available, although the Colonial Government gives a valuation for statistical purposes. The only certain thing known is that the juice-gatherer receives from some employers 50c., and from others 55c. per pound for balata. In addition to this, however, there are other incidental expenses to be added, such as commission to foremen, loss by runaway "gatherers" and capsizing of boats, deaths, thefts, cost of transportation, surveying of concessions on occasion of dispute as to boundaries, assistance of trackers and pilots, etc., etc.

The official statistics show that the value of balata exactly doubled in the four years from 1889 to 1893.

"Return of Balata Extracted from the Colony of Netherlands Guiana."

Year.	Quantity in Kilos.	Value in Florins.
1889	1,509	1,508
1890	76,326	95,407
1891	95,587	143,381
1892	120,680	181,019
1893	32,546	65,092
1894	108,286	216,573
1895	133,681	267,362

[Journ. Imp. Inst., 3, p. 250.]

Physiology and Pharmacology.

The Toxicity of Human Perspiration.

This question is receiving much attention in Paris lately, it having been shown that the perspiration obtained from the flannel vest of a market porter and that taken from the glove of a lady who had danced for several hours, when injected in rabbits gave rise to acute symptoms of poisoning. The question was recently introduced at the Paris Academy of Sciences last week by Arlving of Lyons. He found that the prespiration resulting from muscular exercise, such as bicycling, dancing, fencing, etc., is more poisonous than that produced by a Turkish bath or other artificial means. M. Berthelot mentioned that, according to Africanus, the ancients used the sweat obtained from horses for poisoning the points of their arrows.

[C. & D. 1897, II, p. 256.]

Eel-Serum.

Angelo Mosso of Turin, who first called attention to the poisonous properties of eelblood, also pointed to the similarity between a poisoning resulting from eelserum and that resulting from snake poison. This led C. Phisalix of Paris to use eelserum for purposes of immunization in a similar manner in which serum from the viper had already been used. In order to first deprive the eelblood of its poisonous properties, it is heated for 15 minutes to a temperature of 58°. Of this 10 ccm. can be injected into a gunineapig with impunity, whereas 1 ccm. of the blood before being heated will kill the animal in several hours. Guineapigs immunized in this manner can be injected with snake poison without detriment. The snake poison, however, must not be injected until 16—24 hours after the immunization, otherwise death will result. The immunizing substance is supposed to be of the nature of an albuminose or peptone.

[Die Natur, 46, p. 167; from C. r. de Soc. de Biol.; 1896; p. 1128.]

Literary.

Books and Pamphlets Received.

Charles Scribner's Sons—New York. An Illustrated Flora of the Northern United States, Canada and the British Possessions from New Foundland to the parallel of the southern boundary of Virginia, and from the Atlantic Ocean westward to the 102d meridian. By Dr. Nathaniel Lord Britton, Director-in-chief of the New York Botanical Garden and Hon. Addison Brown, President of the Torrey Botanical Club. Vol. II, pp. 642, *Portulacaceae* to *Menyanthaceae*. 1897. $3.00.

Deutscher Apotheker-Verein—Berlin. Arzneimittel, welche in dem Arzneibuch für das Deutsche Reich, dritte Ausgabe (Pharmacopoea Germanica, editio III), Neudruck 1895, nicht enthalten sind. Zweite Ausgabe. Bearbeitet und herausgegeben von dem Deutschen Apotheker-Verein.* Berlin 1897.

R. Gaertner's Verlagsbuchhandlung—Berlin. Chemisch-technisches Repertorium. Uebersichtlicher Bericht über die neuesten Erfindungen, Fortschritte und Verbesserungen auf dem Gebiete der technischen und industriellen Chemie mit Hinweis auf Maschinen, Apparate und Litteratur. Herausgegeben von Dr. Emil Jacobsen. 36. Jahrgang, 1897. Erstes Halbjahr, erste Hälfte. 1897, pp. 1—136.

Verlag von Gustav Fischer—Jena. Lehrbuch der physiologischen Chemie mit Berücksichtigung der pathologischen Verhältnisse. Für Studierende und Aerzte, von Dr. Richard Neumeister, a. o. Professor der physiol. Chemie a. d. Universität Jena. Zweite, vielfach vermehrte und theilweise umgearbeitete Auflage. Ein Bd., pp. xix. 928. 1897. M. 17.00, geb. M. 19.50.

John Wiley & Sons—New York. Incompatibilities in Prescriptions for students in pharmacy and medicine and practicing pharmacists and physicians. By Dr. Edw. H. Ruddiman. Adjunct Professor of Pharmacy and Materia Medica in Vanderbilt University. One vol., pp. 264. $2.00.

Carl Winter's Universitäts-Buchhandlung — Heidelberg. Gmelin-Kraut's Handbuch der Chemie. Register zur Anorganischen Chemie, in drei Bänden. Sechste umgearbeitete Auflage. Brochure, pp. 81. 1897. M. 2.00.

Depart. of Agr., Div. of Botany—Washington, D. C. Some common poisonous plants. By V. K. Chestnut, Assistant in Division of Botany. Reprinted from the Yearbook of the Dept. of Agr. for 1896. Pamphlet, pp. 10.

Author—The root of phytolacca decandra. By George B. Frankforter and Francis Ramaley. Reprint from the Am. Journ. Pharm. Pamphlet, pp. 10.

Authors—Periodides of pyridine. By P. F. Trowbridge.—Halides and perhalides of pyridine. By P. F. Trowbridge and O. C. Diehl. Reprints from the Journ. of the Am. Chem. Soc. Pamphlet. pp. 10 & 17 resp.

Author—The California manna. By J. U. Lloyd. Reprint from Am. Journ. Pharm. Pamphlet, pp. 10.

—— Empiricism — Echinacea. By J. U. Lloyd. Reprint from the Ecl. Med. Journ. Pamphlet, pp. 8.

—— Physostigma venenosum (Calabar). By J. U. Lloyd. Reprint from Western Druggist. Pamphlet, pp. 8.

Reviews.

Chemisch-technisches Repertorium. Uebersichtlicher Bericht über die neuesten Erfindungen, Fortschritte und Verbesserungen auf dem Gebiete der technischen und industriellen Chemie mit Hinweis auf Maschinen, Apparate und Literatur. Herausgegeben von Dr. Emil Jacobsen. 1896. 30. Jahrgang. R. Gaertner's Verlagsbuchhandlung, Hermann Heyfelder, Berlin. 1897.

This journal has now completed the 30th year of its existence. It appears quarterly, the first and third, and the second and fourth parts of each volume treating the same subjects. The subject-matter of the latter parts includes: paper; photography and printing; wastes, fertilizers, disinfection; soaps; matches and explosives; preparation and purification of chemicals; chemical analysis; apparatus, machines, electrotechnique, pyrotechnique; secret remedies; adulteration of commercial products, book reviews. Among these, it will be seen, are several of special interest to the analytical chemist and the pharmacist. Illustrations are inserted in all cases where they are necessary for the complete understanding of the text. To show the amount of literature covered by the abstract it need only be mentioned that they are taken from 137 journals, representing most European countries and the United States.

Richard Fischer.

Vierteljahresschrift über die Fortschritte auf dem Gebiete der Chemie der Nahrungs- und Genussmittel, der Gebrauchsgegenstände sowie der hierher gehörenden Industriezweige. Redigirt von Dr. A. Hilger, Professor an der Universität München. Elfter Jahrgang, 1896. Verlag von Julius Springer, Berlin. 1897.

The appearance of the fourth part completes the eleventh volume of this valuable quarterly. The aim of the journal, as its name implies, is to report every three months the progress made during that time in the chemistry of foods and food-stuffs. To this end, we find abstracts of all articles published on the subject, and from a variety of sources that would be unavailable to the ordinary chemist. The names of the editors, Dr. A. Hilger, Dr. J. König, Dr. R. Kayser, and Dr. E. Sell to.

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* Geschäftsstelle: Berlin C. 22, an der Spandauer Brücke 14.

gether with those of the sixteen colaborers vouch for the thoroughness of the work.

To give an idea of the subjects treated of, the headings will here be enumerated: meat, peptone and meat preparations, eggs, milk, cheese, butter, food-fats, spices, coffee, cacao and chocolate, tea, sugars, fruit-juices, fermentation phenomena, wine, beer, spirituous liquors, vinegar, starch, flour and bread, drinking water, mineral waters, preserves and preservative agents, analytical methods and apparatus, laws, ordinances and court-decisions, experiment stations, literature. As an examination of this list will show, the subject-matter, while primarily intended for food-chemists, also contains much of interest and value to the pharmacist.

Richard Fischer.

Manuale der neuen Arzneimittel für Apotheker, Aerzte und Drogisten, enthaltend über 2000 neue und neueste Arzneimittel, zusammengestellt von J. Mindes, Magister Pharmaciæ. Druck und Verlag: Art. Institut Orell Fuessli, Zürich. 1897. M. 4.60.

While commenting on the so-called "new remedies" at the beginning of the year (see p. 35 of this journal) the writer called attention to the fact that a certain abuse of the term "new" had led to the use of the word "newer" and expressed the opinion that the use, misuse and abuse of this latter term might ultimately lead to the superlative form of this attribute. In the book before us we have reached that stage. The object of the manual is to enable pharmacists, physicians and druggists to inform themselves readily with reference to the "new," "newer" and "newest" remedies, the book being brought up to date, viz. up to the end of 1896. It contains 2075 articles with 1320 synonyms. In the index the synonyms are arranged alphabetically with the primes.

The list comprises not only chemicals, but the more recent vegetable and animal drugs of our newer materia medica as well, also a number of galenical preparations. The manual will prove exceedingly valuable to most pharmacists and physicians who have no large library with recent journals and yearbooks. Even those who are so fortunate as to possess more detailed information in their library than this manual affords, will find the small volume very convenient for ready reference. Although the book is by no means perfect, it possesses so many practical advantages that it can be strongly recommended to anyone in need of a fairly complete manual of this kind.

E. K.

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Pharmaceutical Review.

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EDITORIAL.

As is well known to the readers of the Review an international medical congress was held at Moscow, and an international pharmaceutical congress in Brussels, both during the month of August. European journals and papers have brought more or less complete reports of both. Although the reports from the medical congress are the less complete at present, it has already become quite evident that a comparison would proove exceedingly odious. Whereas the attendance at Moscow was very large, the attendance at Brussels did not include more than a mere handful from other countries than Belgium. According to an English journal the British Pharmaceutical Society was represented only by the editor of its journal, and from the beginning to the end not a German word was heard in the deliberations of the congress. As far as attendance is concerned the term international does not seem to be justly applicable to the Eighth any more than to the Seventh International Pharmaceutical Congress held at Chicago in 1893. In this connection attention should be called to the fact that German pharmacists, so conspicuously absent at Brussels were in attendance at Moscow.

According to the reports of the proceedings the term international was scarcely justifiable as far as these are concerned. The subjects on the programme were principally of interest to Belgium and almost exclusively presented from the Belgian standpoint.

As was to be expected, the question of an international pharmacopœia was revived at Brussels, but the amusing feature in the revival of this ghost was that a similar seance was conducted at Moscow at the same time. It is also worth noting that apparently it had already been forgotten that the Chicago Congress had appointed a committee to attend to this matter and that the American Pharmaceutical Association had voted the sum of $1,000 to defray the expense of publishing such a book. A committee of three is to report on this matter at the next congress to be held in Paris in 1900. The reader who is interested in the question of international pharmaceutical congresses in general may peruse to advantage some of the articles on this subject from the pen of Dr. Hoffmann in the earlier volumes of this journal. [1885, p. 221; 1889, p. 184; 1890, p. 153; 1892, p. 377; 1893, pp. 1, 51, 104, 200].

At the Dresden meeting last year, the German Apothecaries Society was requested to appoint a commission whose duty it should be to edit a homeopathic pharmacopœia, which like the allopathic pharmacopœia contained a description of the appearance and other characteristics of homeopathic vegetable and animal preparations. Although Hahnemann, the father of homeopathy, was a German his disciples found in America the most favorable conditions for practice and the spread of their doctrines, so that to-day there are said to be more than 12,000 homeopathic physicians in this country, more than twice as many as in all other countries taken together. Yet Germany appears to have produced the largest number of homeopathic pharmacopœias, viz. those of Hartmann, Caspari, Marggraf, Gruner, Hager, Buchner and the Parmacopœa homeopathica polyglotta of Dr. Willmar Schwabe. In fact, the author of the last named work, which since 1872 has appeared in three editions and in six different languages, claims that the American Homeopathic Pharmacopœia is nothing else than a literal translation of his work with the addition of a description of the medicaments.

This question of a German homeopathic pharmacopœia to be recognized by the German government certainly is a matter of great concern to the homeopathic school of physicians. It is also worthy of our attention. It certainly is significant that the request for such a book should proceed from the German apothecaries. Pharmacy is bound to no medical school or doctrines. It is proper that the pharmacist should make homeopathic and eclectic preparations as well as those of any body of medical men whether "regular" or "irregular", whether professing to belong to a school or to be free from schools. As long as the various medical factions cannot unite and no "irregular" preparations can be introduced into the "regular" pharmacopœias, it is well that the various pharmacopœias of the different schools should receive more attention than has been accorded them in the past.

The German apothecaries were, no doubt, influenced in their action by the desire to possess a standard acknowledged by the government enabling them to make homeopathic preparations as uniform as possible and for which they could assume responsibility. There can, however, be no doubt that they were also influenced by pecuniary motives. If such a pharmacopœia is once realized there is no longer any need for the German homeopathic physician to purchase his medicines in the United States as he now largely does. The German apothecary will, no doubt, be the gainer.

In this country the average druggist has so long been in search of "profitable side-lines" that his store looks more like a miniature department store than like an apothecaries' shop. Legitimate pharmacy, as it is now frequently designated, has with many become a side-line and has accordingly suffered. The American pharmacist has fought for recognition as the most important factor to be considered in the preparation of the United States Pharmacopœia. He has received it and has made this work a credit to himself at home and abroad. But he appears to have done nothing, except possibly as an individual, as far as other pharmacopœias are concerned.

Wisconsin will celebrate its semi-centennial as a state in 1898, not by inaugurating a large fair or exposition, but by appropriate festivities partaking principally of an historic character at the capital and in other parts of the state. In harmony with this action the Wisconsin Pharmaceutical Association at its recent meeting at Green Bay appointed a committee to devise plans for a historic session to be held in connection with the Waupaca meeting next August. In order to make such a session a success it will be necessary to rouse a general interest on the part of Wisconsin's pharmacists. Any person, who has attempted systematic work in the study of the history of pharmacy of but a single state, knows how difficult it is to obtain reliable facts. Druggists frequently seem to have forgotten important episodes in the history of their calling in which they played an important part. Others, from whom valuable information might have been received, have died and no record of their activity can be found. It seems a pity that it should be thus, for the history of pharmacy even in our newer states is by no means devoid of interest.

In order to rouse a general interest in this topic on the part of Wisconsin's pharmacists the committee appointed at Green Bay has secured the publication of a series of articles on one phase of the history of pharmacy in Wisconsin, viz. that of pharmaceutical legislation. These articles will appear in the Review beginning with this number. The results of a study extending over several years are here presented, not with an idea of completeness, but with the hope that they will create a more general interest and bring out further facts, thus leading ultimately to a more perfect understanding of this by no means uninteresting subject. The committee further hopes to secure material for a somewhat detailed exposition of the complete history of pharmacy of the state and also a sufficient number of pharmaceutical objects to equip an historic drug store. Whether it will be successful in this or not depends very largely upon a general interest that must first be awakened.

The Review, as a scientific and professional organ, not hampered by geographical boundaries of state or even country or by the interests of school or faction, has as a rule avoided subjects of a decided provincial tone. If it appears to shift somewhat from its former policy in the publication of these articles, attention may justly be called to the fact that deductions which can be drawn from the historic facts therein presented, are of wider than mere provincial significance to the student of American history. Furthermore, it may be hoped that the example set by Wisconsin, if thus made known, will lead other states to become active along similar lines. If this should prove true, the publication of these articles in the Reveiw certainly requires no further justification.

E. K.

ORIGINAL CONTRIBUTIONS.

The Caffein Compound of Kola.[*]

Part II.

KOLATANNIN.

By *James W. T. Knox* and *Albert B. Prescott.*

Combustions of Kolatannin.

The tannin was analysed by combustion with the following stated results:

	I.	II.	III.	Calculated for $C_{16}H_{20}O_8$.
Carbon	56.74	56.81	56.90	56.45
Hydrogen	5.71	5.62	5.76	5.90
Oxygen	37.55	37.57	37.34	37.65
	100.00	100.00	100.00	100.00

Having this satisfactory evidence of the preparation of a pure chemical compound, we next proceeded upon the task of determining its constitution, first by finding the number of hydroxyl groups in the molecule containing C_{16}.

Pentacetyl Kolatannin.

An acetyl derivative was next formed for the object above stated. The tannin was boiled with acetyl chlorid for about one hour under a return condenser, then an equal volume of glacial acetic acid was added, after which the liquid was poured slowly into ice-cold water. The acetyl compound separated out as a voluminous whitish precipitate. This was rapidly filtered at the pump and well washed with cold water, then it was dried with bibulous paper and finally in a vacuum desiccator over sulfuric acid. It was a nearly white or gray-white powder, tasteless, having a faint odor of acetic acid and was insoluble in water, sparingly soluble in ether, and freely and completely soluble in chloroform, in alcohol, and in glacial acetic acid.

Analysis of the body gave the following stated results:

	Found.			Calculated for $C_{16}H_{15}$-$(C_2H_3O)_5O_8$.
By combustion.	I.	II.	III.	
Carbon	56.55	56.68	56.76	56.72
Hydrogen	5.39	5.36	5.24	5.47
Oxygen	38.06	37.96	38.00	37.81
By saponification.				
Acetyl	38.24	38.47	38.68	39.09

On comparing the values given by analysis with those calculated for the pentacetyl derivative, the agreement seems to be satisfactory.

The acetyl values in the analysis by saponification as detailed below are a little low, but it is quite possible that this is to be ascribed to defects in the method of estimation rather than to other causes. At any rate the acetyl content seems without doubt to indicate five hydroxyl groups in the molecule rather than four or six.

The analyses by combustion were made in the ordinary way: the estimation of acetyl was conducted in the manner next described.

Determination of Acetyl.

The acetyl compound, 0.500 to 1.000 gm., varying with the supposed acetyl content is boiled with thirty to forty c. c. of six per cent sulfuric acid in a flask fitted with reflux condenser for two hours. One hundred to one hundred and fifty c.c. water are now added and without filtration the volatile contents of the flask distilled into a known quantity of decinormal potassium hydroxid solution, being careful to avoid a high enough temperature or sufficient concentration to cause distillation of the sulfuric acid. More water is now added to the distilling flask and the distillation repeated. The contents of the receiver should be kept alkaline and a few drops of phenol-phthalein solution added, so that any change in the reaction of the solution may be instantly noted. The distillation should be repeated several times until the last one hundred c.c. of distillate contains no acetic acid. The excess of alkali is to be titrated with decinormal hydrochloric acid, and the amount of acetic acid calculated from the difference between the amount of alkali solution first taken, and the quantity of hydrochloric acid required to neutralize it. Barium chlorid is now added and if any precipitation takes place, the barium sulfate is collected and weighed, the sulfuric acid calculated and correction made for it. If a halogen be present in the acetyl compound a sufficient excess of silver sulfate is added to the contents of the distilling flask before distillation, to precipitate it completely as silver salt.

The above was occasionally deviated from by heating the acetyl compound with the dilute acid in sealed tubes two or three hours at 130°, then cooling, opening, transferring to a flask and distilling as before described.

The following described method was used a few times, but without apparent advantage over the others: The sample is boiled with twenty times its weight of alcoholic solution of potassium hydroxid, of 5.00—8.00 percent alkali strength, in a flask under return condenser. Phosphoric acid is added in excess and the contents of the flask distilled with steam into a receiver containing a known quantity of decinormal alkali solution. To drive the acetic acid over completely requires distillation of about a liter of water. The same precautions are observed as in the preceding methods if halogens are present.

BROMIN DERIVATIVES OF KOLATANNIN.

The bromin compounds of this tannin have been investigated at considerable length, for the purpose of obtaining further data concerning its constitution.

Tribrom Kolatannin.

When bromin water is added to a water solution of kolatannin, a dark colored body is precipitated, and with continued addition of the reagent the precipitation goes on until complete, during which the precipitate formed becomes lighter colored until at the end, in the presence of an excess of bromin, it is pale brownish-yellow and further addition of bromin water produces no change. It is quite voluminous and cannot well be filtered at the pump, but is collected by ordinary filtration and well washed with water until the washings remain clear when treated with silver nitrate solution. It is dried first on porous plates, then in a vacuum desiccator to constant weight.

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[*] Continued from p. 176.

During the process of drying it gradually changes color until it becomes reddish-brown. It is odorless and nearly tasteless, insoluble in water, ether, chloroform and benzene, but is readily soluble in alcohol and in acetone.

In the clear filtrate, after the bromin compound has been removed, hydrobromic acid is easily identified and for that reason the change is believed to be one of substitution. It may be questioned perhaps whether this is not caused by the action of bromin on the water; the bromin water, however, was freshly prepared and the hydrobromic acid formed under these conditions would be very little. But in preparing twenty-five or thirty grammes of this bromin compound, after its precipitation the filtrate was agitated with carbon disulfid to remove the excess of bromin, then separated and the aqueous portion concentrated to small volume, which had an acid taste and reaction and in which hydrobromic acid was easily identified.

The bromin compound was analysed with the following stated results:

		Found.		Calculated for
By combustion.	I.	II.	III.	$C_{16}H_{17}Br_3O_8$.
Carbon.........	32.91	33.12	......	33.28
Hydrogen....	2.69	2.58	......	2.95
Oxygen........	22.86	22.63	......	22.18
As silver salt.				
Bromin........	41.54	41.67	41.62	41.58

The percentage of carbon in this body, when compared with that of the pure tannin from which this was prepared, seemed to indicate the substitution of three hydrogen atoms by that number of bromin atoms.

Pentacetyl Tribrom Kolatannin.

(From Tribrom Kolatannin.)

For the purpose of obtaining further data, an acetyl compound of the bromin derivative was formed: The bromin compound was boiled with acetyl chlorid for about forty-five minutes, under a reflux condenser. An equal volume of glacial acetic acid was added to the clear red solution and the liquid well cooled by freezing mixture. Then it was poured slowly into twelve or fifteen times its volume of ice-cold water, which is constantly stirred. A thermometer should be kept in the beaker containing the precipitate, and if the temperature rises above 10°, it is best to cool the contents by placing the beaker in freezing mixture, resuming addition of the acetyl chlorid on cooling, until all has been used. The acetyl compound separates as a flocculent yellow precipitate, is quickly filtered, well washed and dried, first on porous plates, then in a vacuum desiccator.

It is a tasteless golden-yellow powder, having a faint odor of acetic acid. It is insoluble in water, nearly insoluble in ether, but soluble in alcohol, in acetone, and in chloroform. It loses acetic acid when gently heated, and both bromin and acetic acid on stronger heating. It was analysed with the following stated results:

	Found		Calculated for
By combustion.	I.	II.	$C_{16}H_{12}Br_3(C_2H_3O)_5O_8$.
Carbon............	39.43	39.55	39.65
Hydrogen.......	3.44	3.34	3.44
Oxygen...........	26.57	26.65	26.43
As silver salt.			
Bromin...........	30.56	30.46	30.48
By saponification.			
Acetyl.............	26.91	27.12	27.32

The results obtained agree very closely with the calculated formula and give additional confirmation to the formulas assumed for the pure tannin and its tribrom compound.

Halogen Determination.

For the halogen determinations in the bromin compounds of kolatannin, the well known process of heating the halogen derivative with fuming nitric acid and silver nitrate in a sealed tube for two hours at 175° was followed. Experience taught us, however, to first make a preliminary determination with a considerable excess of silver nitrate to ascertain the approximate amount of halogen present. For example, where in one case the preliminary determination indicated 40.88 percent of bromin, the following ones in triplicate with only a slight excess of silver nitrate were respectively 41.54 p. c., 41.67 p. c., 41.62 p. c. And as a rule the preliminary determinations have given low results, but are necessary to furnish data for the second and more exact estimations.

Having obtained the approximate amount of halogen present, the following details of manipulation were followed: The size of the sample taken is adjusted so that the weight of the resulting silver salt shall be 0.150 to 0.200 gm. Six or eight percent more than the theoretical quantity of silver nitrate is now weighed and placed with the sample in a hard glass tube with six c.c. fuming nitric acid, after which the tube is sealed and heated at 175°—180° for two hours. It is then opened and the contents are transferred to a beaker with about 100 c.c. water and heated on the water bath for one half hour. The silver bromid is then collected on weighed asbestos filters, connected with the pump, washed successively with hot water, alcohol and ether and dried twenty or thirty minutes at 80°—85° to constant weight.

In some cases the excess of silver nitrate in filtrate was determined gravimetrically as silver chlorid for a check on the results.

Our thanks are due to Professor Edward D. Campbell of this University for many valuable suggestions on halogen and acetyl determinations.

Tribrom Pentacetyl Kolatannin.

(From Pentacetyl Kolatannin.)

Having acetylised the tribrom compound of tannin and obtained a pentacetyl derivative of it, we decided to brominate the pentacetyl compound and determine by analysis whether or not the resulting product was identical, in other words to ascertain whether the order in which the substitutions were made affected the result.

This bromination was accomplished by dissolving the pentacetyl tannin in strictly pure, anhydrous chloroform, free from alcohol, and adding a slight excess of bromin. The solvent was then distilled off in partial vacuum, while the brominated acetyl compound remained behind as a golden-yellow mass. This was treated with ether several times and redistilled, using the pump, to remove the traces of chloroform and finally transferred to a vacuum desiccator and left until completely dry.

In color, taste and solubilities this body is identical with that obtained by acetylising the tribrom derivative. It was analysed with the following stated results:

By combustion.	Found. I.	II.	Calculated for $C_{16}H_{12}Br_3(C_2H_3O)_5O_8$.
Carbon	39.49	39.62	39.65
Hydrogen	3.39	3.47	3.44
Oxygen	26.61	26.34	26.43
As silver salt.			
Bromin	30.51	30.57	30.48
By saponification.			
Acetyl	26.84	26.98	27.32

Inasmuch as the results of the analysis of this body coincide quite closely with the theoretical figures as in the preceding case, it may be safely assumed that the bodies are identical and that in the preparation of a pentacetyl tribrom kolatannin it makes no difference whether the bromin or acetyl is introduced first.

Tetrabromin Kolatannin.

We next wished to ascertain whether this tannin was capable of taking more than three bromin atoms into combination in each molecule. Nothing but the tribrom derivative was formed by treating an aqueous solution of the tannin with bromin water in excess, so another solvent was tried successfully. Taking a weighed quantity of tannin, it was dissolved in alcohol and bromin was added gradually to the alcoholic solution in slight excess of the theoretical quantity necessary to form a tetrabrom derivative. The liquid remained clear, all the bromin compounds of kolatannin that we have yet prepared being easily soluble in alcohol. The bromin compound was precipitated by pouring the brominated alcoholic solution into twelve or fifteen volumes of ice-cold water; being insoluble in water, it is separated as a voluminous reddish-brown precipitate, which is filtered, washed and dried in the way already described under the method of preparation of tribrom kolatannin.

This body agrees in solubilities with the tribrom compound; it is slightly darker, however, and has a faint odor of bromin. It was analysed with the following stated results:

By combustion.	Found. I.	II.	Calculated for $C_{16}H_{16}Br_4O_8$.
Carbon	29.59	29.46	29.27
Hydrogen	2.46	2.38	2.44
Oxygen	18.97	18.88	19.52
As silver salt.			
Bromin	48.98	49.28	48.77

This, then, is a tetrabrom derivative of kolatannin. From it an acetyl compound was formed, following the manipulations already described.

Pentacetyl Tetrabromin Kolatannin.

This acetyl compound was yellow and but slightly darker than that of the tribrom derivative. In other physical properties it appeared identical with that body.

It was analysed with the following stated results:

By combustion.	Found. I.	II.	Calculated for $C_{16}H_{11}Br_4(C_2H_3O)_5O_8$.
Carbon	35.82	35.97	36.03
Hydrogen	3.02	2.95	3.01
Oxygen	24.02	24.14	24.02
As silver salt.			
Bromin	37.14	36.94	36.94
By saponification.			
Acetyl	24.42	24.59	24.83

From the above it is seen that the tetrabrom derivative forms a pentacetyl compound equally as easily as the tribrom derivative.

Pentabrom Kolatannin.

This derivative was formed while trying to prepare a hexabrom substitution product, but by reason of an insufficiency of bromin the resulting product yielded analytical results corresponding fairly well with those calculated for pentabrom kolatannin.

By combustion.	Found. I.	II.	Calculated for $C_{16}H_{15}Br_5O_8$.
Carbon	25.87	25.99	26.13
Hydrogen	2.07	1.86	2.04
Oxygen	17.35	17.31	17.42
As silver salt.			
Bromin	54.71	54.84	54.41

This body may be a mixture of the hexa- and tetrabrom tannins. It is somewhat difficult of formation, however, and we have not always been able to obtain it in a manner analogous to the methods of preparation of the other bromin compounds. We do not consider that all conditions necessary to its formation are yet understood. There is no good evidence that this is a mixture of the other derivatives, however, and for the present there is really no sufficient reason for mentioning it as other than a pentabrom tannin. It is soluble in the same agents as the other bromin compounds, and is less stable than the tetrabrom compound, the odor of bromin being much more distinct. It appears to be a characteristic of these bodies, that with increasing percentage of bromin, there is decreasing stability (that is to say a greater tendency to lose bromin), and darker color.

Pentacetyl Pentabrom Kolatannin.

(From Pentabrom Kolatannin.)

This was prepared by acetylising pentabrom kolatannin in the usual way. In properties and appearance it closely resembles the other bromacetyl derivatives, except that its color is somewhat darker yellow. It was analysed with the following stated results:

By combustion.	Found. I.	II.	Calculated for $C_{16}H_{10}Br_5(C_2H_3O)_5O_8$.
Carbon	33.54	33.39	33.02
Hydrogen	2.77	2.65	2.65
Oxygen	20.97	21.37	22.01
As silver salt.			
Bromin	42.72	42.59	42.32
By saponification.			
Acetyl	22.15	22.36	22.75

This body was also prepared from pentacetyl kolatannin as stated next below.

Pentabrom Pentacetyl Kolatannin.

(From Pentacetyl Kolatannin.)

Having ascertained by previous experiment that addition of a considerable excess of bromin to an alcoholic solution of kolatannin, resulted in the formation of a hexabrom derivative, we wished to prepare a hexabrom pentacetyl derivative by brominating the pentacetyl derivative in the same manner.

Analysis of the resulting product showed, however, that contrary to our expectations, not a hexabrom but a pentabrom derivative, was formed, identical with the one described in the preceding section. The analytical results:

By combustion.	Found. I.	II.	Calculated for $C_{16}H_{10}Br_5(C_2H_3O)_5O_8$.
Carbon	33.19	32.97	33.02
Hydrogen	2.60	2.71	2.65
Oxygen	21.90	21.95	22.01
As silver salt.			
Bromin	42.31	42.37	42.32
By saponification.			
Acetyl	22.31	22.47	22.75

Hexabrom Kolatannin.

By treating an alcoholic solution of kolatannin with bromin in considerable excess a hexabrom compound is formed, which is separated in the same way as the tetra- and pentabrom derivatives. It is darker colored than either of the others and has a very distinct odor of bromin. It is soluble in the same media as the other bromin compounds. It was analysed with results stated next below:

By combustion.	Found. I.	II.	Calculated for $C_{16}H_{14}Br_6O_8$.
Carbon	23.48	23.57	23.59
Hydrogen	1.68	1.79	1.72
Oxygen	15.73	15.38	15.73
As silver salt.			
Bromin	59.11	59.26	58.96

Tetracetyl Hexabrom Kolatannin.

(From Hexabrom Kolatannin.)

This acetyl compound was prepared in the usual way, by boiling with acetyl chlorid, and was supposed, before analysis, to be a pentacetyl derivative. It had a dark yellow color, a faintly pungent taste and a slight odor of bromin and acetic acid. Soluble in chloroform and in alcohol, insoluble in water. The analytical results which are next stated show it to be a tetracetyl hexebrom tannin:

By combustion.	Found. I.	II.	Calculated for $C_{16}H_{10}Br_6(C_2H_3O)_4O_8$.
Carbon	29.57	29.39	29.33
Hydrogen	2.21	2.32	2.25
Oxygen	19.41	19.21	19.55
As silver salt.			
Bromin	48.81	49.08	48.87
By saponification.			
Acetyl	16.86	17.19	17.52

Indications of Molecular Constitution.

From the analytical results of the pentacetyl pentabrom tannin and of the hexabrom compound with its tetracetyl derivative, it appears that the total number of groups or atoms which may be substituted in the way described is ten: that if five of acetyl be introduced first only five bromin atoms may be substituted for hydrogen, but that if the bromin be introduced first, six bromin atoms can be introduced by carrying bromination to the limit, and in this hexabrom compound only four hydroxyl groups remain. This appears to indicate that the sixth bromin atom introduced bears a relation to the molecule in some respect different from that of any other bromin atom. But it might be expected that a limit would be reached in the total number of negative groups or atoms which can be retained in the molecule. The greatest number of acetyl groups probably indicates the entire number of hydroxyls. And a balance of evidence seems to favor the conclusion that there are six atoms of hydrogen directly united with the carbon of a benzene chain. These numbers are all in ratio to sixteen atoms of carbon. That the molecule contains C_{16}, or some multiple of this, appears from the quantitative results. We attempted to find the molecular weight of kolatannin, tribrom kolatannin, and pentacetyl tribrom kolatannin by the cryoscopic method, but the results so far obtained are utterly meaningless. Further indications of molecular constitution may be drawn from a study of the anhydrides, account of which next follows, also from the results of the action of acids, and especially from the products by fusion with alkali, all stated further on in this paper.

THE ANHYDRIDS OF KOLATANNIN AND THEIR DERIVATIVES.

By judiciously heating kolatannin several anhydrids may be prepared, as described below, the amounts of water driven off varying with the temperature and the duration of its application. The first anhydrid of the series, that in which two molecules of tannin lose one molecule of water, and of which the empirical formula is $(C_{16}H_{19}O_7)_2O$ is formed by heating kolatannin at 107°-110° to constant weight. This anhydrid is darker colored than the tannin from which it is prepared and is less soluble in water: the second anhydrid, by an oversight, we did not attempt to prepare. If we may judge by the temperature required for the preparation of the first, third and fourth members of the series, this one would result from heating the tannin a sufficient time at 120°-125°. Its theoretical formula is $C_{16}H_{18}O_7$. The third anhydrid $(C_{16}H_{17}O_6)_2O$ results from heating the tannin at 135-140. It is dark reddish-brown and nearly or quite insoluble in water. The fourth anhydrid, $C_{16}H_{16}O_6$ is dark brown, insoluble in water and is the result of heating kolatannin two hours, at 155°-160°.

These anhydrids are all soluble in alcohol, and in solution of kolatannin of sufficient concentration.

First Anhydrid.

The method of preparation has been described in the preceding section. This is a yellowish-red body, soluble in water, in alcohol, and in dilute alkali solutions. The calculated loss of weight of the tannin in preparing this anhydrid was 2.65 per cent. The observed loss of weight was 2.77 per cent. The body was subjected to combustion with the following stated results:

	Found. I.	II.	Calculated for $(C_{16}H_{19}O_7)_2O$.
Carbon	58.27	58.39	58.18
Hydrogen	5.38	5.61	5.45
Oxygen	36.15	36.00	36.37

First Anhydrid of Tribrom Kolatannin.

The first anhydrid of kolatannin was dissolved in water and precipitated by adding an excess of bromin, collecting the precipitate by filtration, and drying exactly as described in the method of preparation of tribrom kolatannin. It is soluble in the same media as tribrom kolatannin, is darker colored, is odorless and tasteless. Analysis of it proved it to be an anhydrid of tribrom kolatannin.

	Found.		Calculated for
By combustion.	I.	II.	$(C_{16}H_{16}Br_3O_7)_2O$.
Carbon	33.61	33.80	33.86
Hydrogen	2.92	2.76	2.65
Oxygen	21.31	21.17	21.16
As silver salt.			
Bromin	42.16	42.27	42.33

First Anhydrid of Tetrabrom Kolatannin.

Prepared in the same way as tetrabrom kolatannin, using in this case the first anhydrid instead of kolatannin. It is hardly to be distinguished from the other tetrabrom compounds in appearance or other sensible properties. It was analysed with the following stated results:

	Found.		Calculated for
By combustion.	I.	II.	$(C_{16}H_{15}Br_4O_7)_2O$.
Carbon	29.47	29.66	29.72
Hydrogen	2.37	2.21	2.17
Oxygen	18.57	18.42	18.58
As silver salt.			
Bromin	49.59	49.71	49.53

First Anhydrid of Hexabrom Kolatannin.

This was prepared by adding a considerable excess of bromin to the alcoholic solution of the first anhydrid of kolatannin, and separating the product in the usual way. It is dark red, tasteless, and has a faint odor of bromin, it is insoluble in water, ether and chloroform; soluble in alcohol and in dilute alkali solutions. It was analysed with the following stated results:

	Found.		Calculated for
By combustion.	I.	II.	$(C_{16}H_{13}Br_6O_7)_2O$.
Carbon	23.96	24.15	23.88
Hydrogen	1.64	1.69	1.49
Oxygen	14.61	14.57	14.93
As silver salt.			
Bromin	59.79	59.59	59.70

Third Anhydrid of Kolatannin.

The method of preparation has been described. The calculated loss of weight on heating the tannin was 7.96 per cent; the observed loss was 8.16 per cent. It is a red-brown powder, odorless, nearly tasteless, but somewhat astringent. Soluble in alcohol and in alkali solutions, insoluble in water, ether and chloroform. It was analysed with the following stated results:

	Found.		Calculated for
By combustion.	I.	II.	$(C_{16}H_{17}O_6)_2O$.
Carbon	61.72	61.80	61.54
Hydrogen	5.29	5.46	5.13
Oxygen	32.99	32.74	33.33

The bromin derivatives of this anhydrid, and those of the fourth anhydrid, to be described further on in these pages, were prepared in a manner strictly analogous to those already described.

Third Anhydrid of Tetrabrom Kolatannin.

A dark brown tasteless powder having a faint obor of bromin. Insoluble in water, ether or chloroform; soluble in alcohol and in alkali solutions. The analytical results:

	Found.		Calculated for
By combustion.	I.	II.	$(C_{16}H_{13}Br_4O_6)_2O$.
Carbon	30.59	30.73	30.57
Hydrogen	1.99	1.81	1.91
Oxygen	16.32	16.19	16.56
As silver salt.			
Bromin	51.10	51.27	50.96

Third Anhydrid of Hexabrom Kolatannin.

A dark brown tasteless powder having a distinct odor of bromin. It is insoluble in water, ether and chloroform; soluble in alcohol and in alkali solutions.

The analytical results:

	Found.		Calculated for
By combustion.	I.	II.	$(C_{16}H_{11}Br_6O_6)_2O$.
Carbon	24.04	24.39	24.43
Hydrogen	1.52	1.38	1.27
Oxygen	13.22	12.88	13.23
As silver salt.			
Bromin	61.22	61.35	61.07

Fourth Anhydrid of Kolatannin.

This was prepared in the way previously described. The calculated loss of weight attendant upon its preparation from kolatannin is 10.61 percent; the observed loss was 10.78 percent. It is a dark brown, odorless, tasteless powder, soluble in alcohol and in alkali solutions; insoluble in water, in ether and in chloroform. It was analysed with the following stated results:

	Found.		Calculated for
	I.	II.	$C_{16}H_{16}O_6$.
Carbon	63.20	62.98	63.37
Hydrogen	5.09	5.16	4.95
Oxygen	31.71	31.86	31.68

Fourth Anhydrid of Tetrabrom Kolatannin.

A dark brown tasteless powder having a faint odor of bromin. Soluble in alcohol and in alkali solutions; insoluble in water, in ether and in chloroform. It was analysed with the following stated results:

	Found.		Calculated for
By combustion.	I.	II.	$C_{16}H_{12}Br_4O_6$.
Carbon	30.91	30.68	31.02
Hydrogen	1.95	1.86	1.78
Oxygen	15.40	15.58	15.51
As silver salt.			
Bromin	51.74	51.88	51.69

Fourth Anhydrid of Hexabrom Kolatannin.

A very dark brown powder having a distinct odor of bromin. Soluble in the same media as the previously described bromin compounds. The analytical results:

	Found.		Calculated for
By combustion.	I.	II.	$C_{16}H_{10}Br_6O_6$.
Carbon	24.96	24.79	24.71
Hydrogen	1.39	1.31	1.16
Oxygen	11.70	12.01	12.35
As silver salt.			
Bromin	61.95	61.89	61.78

(To be continued.)

Volatile Oils and their Assay.*

By *Edward Kremers.*

(Report of Research Committee G, U. S. P. Revision.)

Introduction.

Wherever the term "volatile oil" or its synonyms have been used by scientists, the danger of misunderstanding has on the whole been very slight. The danger, however, is greatly increased when an attempt is made to define the term. The chapters on volatile oils in numerous pharmaceutical works are prefixed by an almost meaningless definition and by an even worse classification. The authors, like many lawyers and preachers, at times evidently labor under the erroneous supposition that logic is spellbound to an arrangement into first, second and third. It is not necessary to comment on these definitions and classifications. A single sentence from the pen of an authority on the history of volatile oils, however, may be worth quoting. Flueckiger, after showing what the development of organic chemistry had done for a better conception of volatile oils, makes the following statement:

"It may be said that this advance in knowledge really annihilated the conception of 'essential oil,' which was soon demonstrated to be nothing further than a convenient general expression, incapable of clear definition.†" For the purposes of this report the general though vague conception of the class of substances known as volatile or essential oils will have to suffice. It will no doubt prove more efficient than a harnessed array of words parading under the false flag of definition.

Both the vegetable and animal kingdoms are permeated, as it were (not to be taken literally), with substances more or less volatile, or with substances which upon some form of decomposition or other may become volatile. Sometimes these substances, though difficultly volatile by themselves, are made more volatile by the presence of others. These substances, or possibly better, these mixtures of substances, can be isolated from the larger bulk of non-volatile material, non-volatile under the conditions under which the isolation is effected. This qualification is essential for two reasons, only one of which need here be emphasized, viz., that under the conditions under which the isolation is carried on certain substances originally volatile may become non-volatile.

The sum total of volatile substances isolated, generally termed the volatile or essential oil, therefore, may differ according to the process employed. For several centuries volatile oils have been prepared almost universally by distillation with water vapor. Perfumers, however, have long been aware that some of the finest aromas of flowers could not be extracted in this manner and have employed processes which excluded water as completely as possible. Although a decade since, the chemist could demonstrate no chemical difference (i. e. by chemical analysis) between an oil of lemon distilled with water vapor and a hand-pressed oil from the same fruit, the perfumer and gourmand were well aware of a great difference between the two. Although even to-day lemon oil is usually classified with the terpene oils in the systems referred to above, it is now known that the limonene largely serves as a diluent for other more odoriferous substances, principal among which is citral, an aldehyde which will not stand the rough treatment of distillation with water vapor, but polymerizes to substances devoid of the agreeable odor of the citral. Such instances might be multiplied, but a single other illustration may suffice. It is possibly to-day supposed by most pharmacists that oils containing eugenol are of value simply on account of this phenol. Inasmuch as eugenol has a high sp. gr., the higher the sp. gr. of the oil the better it is usually supposed to be. Since eugenol is but slightly if at all affected by steam, such oils are prepared by distillation with water vapor. It is also generally supposed that to distill such an oil, all that is necessary is to heat the material with water or to pass steam through the plant or part of plant containing the oil. It by no means follows, however, that the product, granting the very same crude material in both cases, will be alike. The manner in which the distillation is conducted, time of distillation, pressure of steam, etc., may have no little influence on the yield and composition of the final product. Details illustrating this point more fully will be given under their proper headings.

But we shall have to go back still farther for differences of no mean significance. It may suffice simply to recall the chemical changes that are constantly going on almost everywhere. We know that in solutions the change of a single degree in temperature may disturb the chemical equilibrium of such solutions; that a single light frost may destroy the volatile oil so-called in an entire crop of herb. The action of the atmospheralia and of parasitic organisms is even less understood. We do not even know why the plant or animal organism produces this so-called volatile oil, or even how. It has been empirically observed that dryness or moisture, hot, temperate or cold climate may increase the quantity or flavor of an oil, but even these observations have not infrequently led to false conclusions. The question why *Monarda punctata* appears always to generate thymol, and the related species *Monarda fistulosa* the chemically closely related phenol carvacrol, is a perfect mystery. Or why is it that the same plant, e. g. *Thymus vulgaris*, at times produces thymol, at other times carvacrol, or both? Why is it that the fennel plant sometimes produces largely anethol, at other times only a small amount of this phenol ether and a considerable percentage of the ketone fenchone? Our knowledge of the chemical composition of the volatile oils, in spite of the enormous strides, relatively speaking, that have been made during the last decade or two, is still so insignificant, that with increasing knowledge we may expect variations of this kind to prove the rule rather than the exception. We are just beginning to arrive at a faint conception of the subtleness of chemical changes induced by changes in mode of life or even temperament. Yet in the case of the isolation of volatile oils the life is first destroyed. A single instance may assist to emphasize this fact. In order to obtain a good rose-water, the rose-petals must be distilled at once, otherwise "fermentation" (a good word since we do not understand the chemistry of the change) takes place and ordinary alcohol is one of the products produced. The practical difference of note is that the oil obtained from such "fermented" rose-petals is rich in worthless paraffin hydrocarbons, indicating that some of the truely valuable substances have been converted possibly into worthless ethyl alcohol and no doubt into other substances.

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* Read in abstract at the Minnetonka meeting of the Am. Pharm. Ass'n.

† The Factories of Schimmel & Co., Introductory text.

In addition to these variations and changes due to differences in climate, idiosyncracies of the plant, mode of collection and process of manufacture we shall have to note another class of changes, viz. those that take place in the finished product. Such changes become apparent in differences of odor and of solubility, of sp. gr., of optical rotation, viscosity, boiling point and loss of volatility with water vapor. To illustrate these assertions by citing examples for each would lead too far. Besides, some of these changes are among those readily noticed by the observing pharmacist and therefore do not present anything new.

After this introduction we may be less inclined to define the term volatile oil, but we may nevertheless be better prepared to discuss what we may expect of a given volatile oil. Unless otherwise specified, the U. S. Pharmacopœia apparently takes it as granted that a volatile oil is prepared by distillation. Aside from variations in the plant, we have already seen that different modes of distillation can produce different oils. It may be mentioned in this connection that e. g. oil of bay and oil of cloves, as prepared by distillation by the two largest distillers of volatile oils in this country, do not come up to the required sp. gr. of the U. S. P. for reasons that will be mentioned under the respective headings. Yet if the finished product is to correspond as closely as possible to the original contents of the drug, the oils with the lower sp. gr. are the more ideal product, i. e. judged by our present knowledge. Such oils can be readily brought up to the required standard of sp. gr., either by the addition of eugenol, or by the removal of a certain constituent or constituents, which, however, appear to be characteristic for these oils. Such an oil, however, is no longer the simple oil. It has been "meddled with." Is such "meddling" lawful? If not, how is the pharmacist to obtain an oil that comes up to the U. S. P. requirement with regard to sp. gr.?

Other oils like caraway, spearmint, etc., may comply with the U. S. P. requirements when freshly distilled. Before these oils reach the dispenser, or especially on the shelves of the dispenser these oils may undergo more or less partial decomposition. The oil becomes colored, its odor has been impaired, it has formed a fair percentage of non-volatile substances. In order to get around these difficulties in part, the manufacturer rectifies the oil, indeed rectifies it several times. The final product for most practical purposes is an improvement over the crude oil, but is no longer the ideal (in the sense of natural) oil. During the repeated distillations the less stable substances have been decomposed and have remained behind. If oil of caraway pure and simple is the oil required by the Pharmacopœia, is the pharmacist justified in dispensing a modified product though this may be considered an improvement by some or even by most persons?

Let us go a step farther. Oil of peppermint contains a large variety of substances. Over twenty substances belonging possibly to half a dozen classes of chemical compounds have already been isolated and identified. To no small extent the oil is distilled by farmers who sell the oil to intermediates. When American oil was high in price, Japanese oil has been added. But Japanese oil is a poor adulterant on account of the bitter taste apparently readily recognized by connoisseurs. However, menthol from Japanese oil is the same as that from American or any other oil. If the sp. gr. of the American oil for one reason or another happens to be low, it can be raised by the addition of menthol. No doubt, most persons would regard this as an improvement, but are even improvements justified when not prescribed?

There is another way in which peppermint oil can be improved and even more effectually. Besides menthol, menthone, menthyl esters and certain hydrocarbons American peppermint oil, at least sometimes, contains some of the lower fatty aldehydes and even dimethyl sulphide, a perfect stench when not greatly diluted by the other more abundant constituents of the oil. These malodoriferous substances can readily be removed by rectification or fractional distillation with steam. Such a rectified oil will very likely have a higher sp. gr.; will contain a greater percentage of menthol, possibly also of menthyl esters; and will be more soluble in alcohol. Is such an oil, which has been "meddled with," though improved, justified before the law? It is not at all improbable that most peppermint oils have been "meddled with" in some such manner after their first distillation, but very likely in most cases no one but the "meddler" can prove it.

Let us take a somewhat different case. Pharmaceutical journals have repeatedly published methods and working formulas according to which resinified and "terebinthenated" specimens of oil of lemon could be corrected. The processes almost invariably if not always involved distillation with water vapor. Now it has long been known that oil of lemon prepared by distillation is inferior to the hand pressed oil. Whereas ten years ago the chemist could not explain this difference, he can at least in part explain it to-day. Such a rectified oil may be a temporary partial improvement over the deteriorated oil, but it is not likely to come up to the original standard in quality. Is such so-called improvement justifiable?

This illustration leads to another point to be considered. For some years so-called quintessential and terpeneless oils have been introduced into the market. After the discovery of a considerable number of oxygenated compounds in oils the belief has been more or less generally currant that only these were essential and that the hydrocarbons present, the so-called terpenes, were but diluents and could be discarded if inconvenient. Thus a more or less pure carvone fraction is supposed to contain all the virtues of caraway oil, as a certain fraction of lemon oil rich in citral is substituted for the entire oil. The advantage of such quintessential oils to liquor manufacturers may not be questioned, but is the pharmacist justified in dispensing them when the oil as such is prescribed? Any person familiar with the chemistry of caraway oil knows that carvone and limonene are not the only constituents of caraway oil. No other substances have been reported as having been isolated from spearmint oil. Why not permit the substitution of spearmint oil for caraway oil, or of quintessential spearmint oil supposed to be principally carvone for quintessential caraway oil, almost pure carvone?

To go one step farther, the question now suggests itself, is the substitution of anethol for anise oil to be permitted? If it is, why should its substitution for fennel oil not also be permitted? The difference in the two cases is not so much one of principle but of degree.

It might do no harm if in the present days of food and drug laws the Pharmacopœia were somewhat more specific on these points. There is no reason why in certain cases rectified or otherwise improved oils should not be preferred to crude oils, why definite chemical substances, such as anethol, eugenol, cineol, menthol should not be used to great advantage. But it does not appear right to the writer that one should be substituted for the other, any more than an alkaloid may be substituted for the crude drug or a pharmacopœial preparation of such a drug; or why a tincture prepared from a fluid extract should be permitted to be dispensed as long as the Pharmacopœia requires such tincture to be prepared directly from the drug; or why a fluid extract prepared with a different menstruum than that of the U. S. P. should be permitted to be substituted for one of the U. S. P., no matter what superiority the manufacturer may claim for his method of preparation.

Although morphine and quinine were introduced early in the century, the closing years of the present cycle still witness the very frequent use of the respective crude drugs or their galenical preparations. If definite chemicals could be used generally in place of crude drugs and galenicals, medicine and pharmacy would be simplified even more than they are to-day. The temptation to overdo matters in this direction is very great and modern scientists have sinned greatly by assuming an air of knowing it at all if they knew but a single fact. We have witnessed the going into disuse of standard preparations by making them quasi scientific.

Admitting then that our present knowledge is but the dot on the i, how are we to know what to expect of a volatile oil? All that we can do, in fact, all that we ever shall be able to do is to judge these products by our most advanced knowledge of them. There was a time when the oils were judged simply by their odor, color and taste. In fact these are important criteria to-day to the connoisseur. This favored gentleman may distinguish readily between true wintergreen oil from *gaultheria* and so-called wintergreen oil from the sweet birch by the odor. He will classify his samples accordingly and verify his sensory analysis with the use of the polariscope. But most persons are not favored with such an analytic sense of smell.

Later sp. gr. was introduced as a valuable criterion. But as it became known that equally authentic oils might differ considerably in sp. gr., that the same specimen could materially change its sp. gr. upon standing, and that the adulterer found it very easy to make contaminated oils come up to the required standard of sp. gr., this standard by itself lost considerable of its former significance.

Other physical constants were determined and each hailed as a new check upon adulteration and fraud, yet not one finds as general application in actual practice as the sp. gr. test. The test of solubility in alcohol, especially somewhat diluted alcohol, is gaining favor. But too little is at present known to make it reliable in any more than a very limited number of cases. An oil perfectly soluble to-day may be imperfectly soluble tomorrow. No general rules can be laid down and much experimentation will be necessary before the real value of this test will be known.

Tests of a chemical nature were initiated in the form of color reactions with strong acids etc. The historic iodine test for turpentine oil will, no doubt, be remembered by many. Volumes have been written on this subject and some of them were relegated to the archives as soon as they issued from the printer's press to be disturbed only as curiosities.

The strictly chemical study of volatile oils during the last fifteen or twenty years, which, to use Flueckiger's words once more, "really annihilated the conception of volatile oils," is preparing the way for a better understanding of these interesting products and incidentally also for the examination and assay of commercial articles. For the benefit of those who have no use for that which is scientific, but glory in the practical, let it be stated that a few theorists at German universities and a factory that employs doctors of philosophy instead of volatile oil apprentices have done more for a more rational understanding of this subject than all pharmacists of all countries during the entire past century.

Let it be understood that the way is not already prepared, but is being prepared. Although on the right path, we are but at the beginning of a road by no means easy of travel at present.

The strictly chemical study of the volatile oils which has proven so fruitful during the past decade and a half will have to be made the basis for the rational examination of volatile oils. Inasmuch as at present so little is known about the chemical composition of volatile oils, all that can be done at present is to test for certain constituents, whether these be characteristic of the oil or not. These may best be grouped chemically in the ordinary manner: Hydrocarbons; alcohols (incl. phenols), ethers (incl. phenol ethers) and the corresponding thio alcohols (mercaptans), and thio ethers (e. g. dimethyl ether); aldehydes and ketones; acids (incl. lactones) and esters.

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Popular Scandinavian Names of Drugs and Medicines.

By *Harold Bruun.*

Aconit urt,	Aconite herb.
" tinctur,	" tincture.
Aegte Kanel,	Ceylon cinnamon.
Aetskali,	Caustic potash.
Aetsnatron,	" soda.
Afförende latvaerge,	Confection of senna.
" pulver,	Compound licorice powder.
Agurk,	Cucumber.
" vild,	Wild cucumber.
Alantrod,	Elecampane.
Albark,	Alnus (Alder bark).
Alkohol,	Alcohol.
" Ethyl,	Ethyl alcohol.
" Methyl,	Methyl alcohol.
Allehaande (ellerpiment),	Allspice.
Alruna,	Mayapple.

Altheasaft,	Syrup of Althæa.
Alun,	Alum.
" ammoniak,	Ammonia alum.
" kali,	Potassium alum.
Alunrod,	Alum root.
Amerikansk Braekrod,	Ipecac root.
" Enzianrod,	Gentian root.
" Feberurt,	Fever root.
" Olje,	Castor oil.
" Ormefrö,	Worm seed.
" Pinkrod,	Pink root.
" Senna,	American senna.
Ammoniak,	Ammonia water.
" Baldriansurt,	Ammonium valerianate.
" Brom,	Ammonium bromide.
" Chlorsurt,	Ammonium chloride.
" Gummi,	Gumresin ammoniac.
" Jod,	Ammonium iodide.
" Kulsurt,	Ammonium carbonate.
" Phosphorsurt,	Ammonium phosphate.
Anis,	Anise.
Anisfrö,	"
Anisdraaber,	Camphorated tincture of opium.
Anisvand,	Anise water.
Apelsin (see pomerants),	Orange.
" skaller, bitre,	Bitter orange peel.
" " söde,	Sweet " "
Arabisk gummi,	Gum Arabic.
Aralia nudicaulis,	False sarsaparilla.
Arekanödder,	Areca nut.
Aromatisk edike,	*Acetum aromaticum.*
" tinctur,	Aromatic tincture.
Arrow mel,	Arrow root.
Arnica blomster,	Arnica flowers.
" Tinctur,	Tincture of arnica.
Arsensyrling (hvid arsenik),	Arsenious acid.
Arsenicjod,	Arsenic iodide.
Asktrae,	White ash.
Atropin, svovlsurt,	Atropine sulfate.
Baevergjael,	Castoreum.
" tinctur,	Tincture of castoreum.
Baldrian rod,	Valerian root.
" surt ammoniak,	Ammonium valerianate.
" " Chinin,	Quinine valerianate.
" " jernoxid,	Iron valerianate.
" " natron,	Sodium valerianate.
" " Zinkoxyd,	Zinc valerianate.
" olje,	Oil of valerian.
Balsam kopaiva,	Copaiva balsam.
" tolu,	Tolu balsam.
Bankebyg,	Pearl barley.
Bark Angustura,	Angustura bark.
" Bomuldrod,	Cotton root bark.
" Brombaerrod,	Blackberry bark.
" China,	Peruvian bark.
" " graa,	" " , pale.
" " gul,	Calisaya bark.
" " konge,	" "
" " röd,	Red Peruvian bark.
" Ege,	Oak bark.
" Elmetrae,	Slippery elm bark.
" Granataeblerod,	Pomegranate root bark.
" Hestekastanie,	Horsechestnut bark.
" Kaaltrae,	Cabbage tree bark.
" Kaskarille,	Cascarilla bark.
" Kirsebaer, vild,	Wild cherry bark.
" Mangostane,	Mangosteen.
" Piletrae, hvid,	Willow bark.
" Saebeurt,	Soap bark.
" Törstetrae,	Frangula bark.
Barnepulver,	Compound rhubarb powder.
Beg, burgundisk,	Burgundy pitch.

Beg, sort,	Black pitch.
Belladonna blade,	Belladonna leaves.
" rod,	" root.
Beenved,	Privet.
Bengalisk kvaede,	Bael fruit.
Bensort,	Animal charcoal.
Benzoesyre,	Benzoic acid.
Benzoegummi,	Benzoin.
Benzoelaurbaerbusk,	"
Benzoesurt ammoniak,	Ammonium benzoate.
Berberin, svovlsurt,	Berberine sulphate.
Berberisbusk bark,	Barberry bark.
Bergamot olje,	Oil of bergamot.
Berlinerblaat,	Iron ferrocyanide.
Bertramblomster persisk,	Persian insect flowers.
Bertramrod,	Feverfew.
Betelnödder,	Areca nut.
Bibirubark,	Nectrandra.
Birk,	Birch.
Bitter mave chaaber,	Bitter stomach drops.
Bittermandel,	Bitter almonds.
" olje,	Oil of bitter almonds.
" vand,	Bitter almond water.
Bitterjord,	Manganese sulphate.
" the,	*Species amaræ.*
" tinctur,	*Tinctura amara.*
Bittersalt,	Magnesium sulphate.
Bittersöd,	Bittersweet.
Bitre rhabarberdraaber,	*Tinctura rhei amara.*
Blaaklokke,	*Centaurea cyanus.*
Blaasyre,	Hydrocyanic acid.
" kali,	Potassium cyanide.
" natron,	Sodium cyanide.
" kviksölv,	Mercury cyanide.
Blaabaersyrup,	Syrup of blue berries.
Blade Belladonna,	Belladonna leaves.
" Boldo,	Boldo leaves.
" Bucco,	Buchu leaves.
" Bukke,	Buckbean.
" Bulmeurt,	Henbane leaves.
" Fingerbölle,	Foxglove.
" Hestemynte,	Horsemint.
" Hesthov,	Colts foot (*tussilago*).
" Kastanie,	Chestnut leaves.
" Kirselaurbaer,	Cherry laurel leaves.
" Koka,	Coca leaves.
" Karbendikt,	Blessed thistle.
" Kornvalmue,	Red poppy petals.
" Krusemynte,	Curled mint.
" Laurbaer,	Laurel bay leaves.
Blade Matico,	Matico leaves.
" Melbaer,	Uva ursi leaves.
" Melisse.	Lemonbalm.
" Mynte, romersk,	Spearmint.
" Pebermynte,	Peppermint.
" Pigaeble,	Stramonium leaves.
" Rosen, blegröde,	Pale rose leaves.
" " mörkeröde,	Red rose leaves.
" Salvie,	Sage.
" Sennes,	Senna leaves.
" Sesame,	Benne leaves.
Blodigle,	Leech.
Blodrensende Urter,	*Spec. emollientes.*
Blodsten,	Haematite.
Blodurt,	Tormentilla.
Blaa vitriol,	Copper sulphate.
Bly edike,	Solution of lead subacetate.
Bly hvidt,	Lead carbonate.
" oxyd,	Lead oxide.
" plaster,	Lead plaster.
" vand,	Lead water.

Bly salve,	Ointment of lead acetate.
“ jod,	Lead iodide.
“ salpetersurt,	Lead nitrate.
“ sukker,	Sugar of lead (Lead acetate).
Blyant,	Graphite.
Boccoblade,	Buchu leaves.
Bolus, hvid,	Bole.
Boldo blade,	Boldo leaves.
Bomolje,	Olive oil.
Bomuld,	Cotton.
Bomuldrodbark,	Cotton root bark.
Borsurt ammoniak,	Ammonium borate.
“ natron,	Borax.
Borrerod,	Bardanna root.
Braendt alun,	Burnt alum.
“ gyps,	Plaster of Paris.
“ kalk,	Calcium oxide.
“ magnesia, let,	Burnt magnesia.
“ “ tung,	Heavy magnesia.
“ sukker,	Caramel.
Braendenesle,	Nettle.
Braekrod,	Ipecac root.
“ vin,	Wine of ipecac.
Braekvinsten,	Tartar emetic.
Bregnerod,	Male fern.
Brom,	Bromine.
Bromalhydrat,	Bromal.
Bromammonium,	Ammonium bromide.
Bromkali,	Potassium bromide.
Bromnatron,	Sodium bromide.
Bromjern,	Iron bromide.
“ jod,	Iodine bromide.
“ kalcium,	Calcium bromide.
“ lithium,	Lithium bromide.
Brombaerrodbark,	Blackberry bark.
Bromvandstofsyre,	Hydrobromic acid.
Bromzink,	Zinc bromide.
“ aethyl,	Ethyl bromide.
Brunelle,	Heal all.
Brunsten,	Black oxide of manganese.
Brystbaer,	Jujube berries.
Brystdraaber,	*Liq. pectorales.*
Brystthe,	*Spec. pectorales.*
Bruspulver,	*Pulv. effervescens.*
“ afförende,	“ “ *comp.* (Seidlitz powders).
Bröd, Johannis-,	St. Johns bread.
Bringebaer,	Raspberries.
“ syrup,	Syrup of raspberries.
Bukkehornfrö,	Fenugreek seed.
Bukkeblade,	Buchu leaves.
Bukkeskjaeg,	Goats beard.
Bulmeurt blade,	Henbane leaves.
“ olje,	Oil of henbane.
Bygmalt,	Barley malt.
Cajeput olje,	Oil of cajeput.
Campher draaber,	*Aether spirt. camphor.*
“ mixtur,	*Mixt. camphor.*
“ “ sure,	*Mixt. camphor acid.*
“ olje,	Camphorated oil.
“ spiritus,	Camphor spirit.
“ olje, hvid,	Camphor liniment.
Campechtrae,	Logwood.
Canadisk erigeron olje,	Erigeron oil.
“ the,	Wintergreen.
“ “ olje,	Wintergreen oil.
Cannastivelse,	Canna starch.
Copaivabalsam,	Capaiba balsam.
Carbolsyre,	Carbolic acid.
Carbolvand,	Solution of carbolic acid, 3%.
Cardemome,	Cardamom.
Cathartinsyre,	Cathartic acid.

Cedertrae, röd,	Red cedar.
Charpi, engelsk,	Lint.
Chinin,	Quinine.
“ baldriansurt,	“ valerianate.
“ chlorsurt,	“ hydrochloride.
“ svovlsurt,	“ sulphate.
China Decoct,	*Decoct calisayæ.*
“ “ surt,	“ “ *acidum.*
“ vin,	Wine of calisaya.
Chlorjern,	Iron chloride.
“ draaber,	Tincture of chloride of iron.
“ oplösning,	Solution of chloride of iron.
Chlorsurt kali,	Potassium chlorate.
“ natron,	Sodium chlorate.
Chlorkalk,	Chlorinated lime.
Chlorvandstofsurt chinin,	Quinine hydrochloride.
“ morphin,	Morphine hydrochloride.
“ zinc,	Zinc hydrochloride.
Chlorvandstofsyre,	Hydrochloric acid.
“ fortyndet,	“ “ dilute.
Chlorzink,	Zinc chloride.
Chocolade,	Chocolate.
Christtorntrae,	Holly.
Citron,	Lemon.
Citronsaft,	Lemon juice.
Citronolje,	Oil of lemon.
Citronsyre,	Citric acid.
Citronsurt jernoxyd,	Iron citrate.
“ “ ammoniak,	Iron and ammonia citrate.
“ “ chinin,	Iron and quinine citrate.
“ kali,	Potassium citrate.
“ natron,	Sodium citrate.
Cocao smör,	Cocao butter.
Cocao bönner,	Cocao beans.
Colchicum vin,	Wine of colchicium.
Cochenille,	Cocheneal.
Colokvint,	Colocynth.
“ tinctur,	Tincture of colocynth, compound.
Columbo rod,	Columbo root.
Cyan kali,	Potassium cyanide.
“ natron,	Sodium cyanide.
“ sölv,	Silver cyanide.
“ kviksölv,	Mercury cyanide.
“ zink,	Zinc cyanide.
Cammomille blomster,	Chammomile flowers.
“ “ romersk,	Roman chammomile.
Decoct Asketraebark,	Decoct. of white ash.
“ China,	“ of calisaya.
“ “ surt,	“ of calisaya, acid.
“ Lövetand,	“ of taraxacum.
“ Sennes blade,	“ of senna leaves.
Desmer,	Musk.
Dialyseret jern,	Dialysed iron.
Digitalisblade,	Digitalis leaves.
Dill,	Dill.
Dillolje,	Oil of Dill.
Dipelsolje,	Animal oil, Dippel's.
Ditabark,	Ditabark.
Donovans Oplösning,	Donovan's solution.
Drageblod,	Dragons blood.
Dugurt,	Sun dew.
Dyvelsdraek,	Asafetida.
“ draaber,	Tincture of asafetida.
Dustepulver,	Lycopodium.
Edike aether,	Acetic ether.
Edikesyre,	Acetic acid.
Edikesurt blyoxyd,	Lead acetate.

(To be continued.)

Early Phases in the Development of Pharmaceutical Legislation in Wisconsin.

By *Edward Kremers.*

For several years past the writer has spent odd hours of his summer vacations in seeking information with regard to a fragment of Wisconsin's history that ought not to be devoid of interest to the pharmacist or to the student of the history of our institutions. Pharmaceutical legislation has become an established fact in Wisconsin as well as in most states of the Union. Yet there was a time when the regulation of the practice of pharmacy in Wisconsin as well as elsewhere was fought tooth and nail. Strange as it may seem at first, and yet only naturally, when understood, the pharmaceutical legislation demanded by some was combatted by legislation of similar though less exclusive character on the part of others and thus were inaugurated the first laws regulating the practice of pharmacy in Milwaukee. These laws soon proved the steppingstone to legislation for the entire state.

The writer does not claim competency to write history, yet in this case he does not apologize for entering upon a field that does not fall within the domain of his specialty. Pharmacy has commercialized to such an extent that even the well trained pharmacist seems to have no time left to write the history he has helped to make. The general historical student, on the other hand, has so many problems of greater interest to him that he possibly is not even aware of the movement to which the writer desires to call attention.

Those who took a more or less active part in this movement seem to have forgotten largely about it, while others who might give information have died. The object in presenting this paper is to revive, if possible, an interest in a very short period of our pharmaceutical history, which certainly is unique. It is to be hoped that a somewhat connected statement of what excited not only the minds of pharmacists, but of newspaper editors and other writers as well, will bring back to memory facts that are still necessary to throw a better light on the period that ultimately gave birth to our state pharmacy act.

It would, no doubt, be of interest to review, as well as is possible at present, the early history of the drug business and of pharmacy in this state from the time when Mr. King is said to have opened the first drugstore west of Detroit, viz. in Green Bay, or when Mr. Higby hung out his sign as druggist on East Water Street in Milwaukee in 1836. Such a review might lead to a better understanding of the subject to be presented, but it will have to be omitted at present. The facts, to which the writer desires to call special attention at the present time, do not smack simply of a local flavor, but are not altogether devoid of what the Germans designate by "culturhistorisches Interesse."

National Museum at Nuremberg.
(The home of the German historic pharmacy.)

As is well known, Milwaukee received a large number of German immigrants from the fifties on. Among these were not only ordinary laboring men, but men well trained in the trades, teachers, physicians and apothecaries. As can be seen from a perusal of the city directories, the last class mentioned must in the course of time somewhat have changed the complexion of the original pioneer drug-trade. In 1875, the year in which our story begins, there were forty druggists or pharmacists in Milwaukee, thirty of whom were either Germans or German-Americans. As to the exact status of the pharmaceutical training of these men nothing very definite can be mentioned at present. Suffice it to call attention, on the one hand, to the fact that but very few men were warranted in calling themselves "deutscher Apotheker" in any other than the conventional American sense.

The title "Apotheker" in Germany implies a course of technical training and study covering a period of eight years and the passing of a state board examination. It is the legal equivalent of our licentiate grade of registered pharmacists. Many who came over from the fatherland had only a part of this training. On the other hand, it should be emphasized that their training at the Gymnasium, and as apprentices and assistants in well equipped pharmacies and under educated men, compared very favorably with the education and training of the average Milwaukee druggist previous to their advent.

That these men should have been displeased with the state of affairs is but natural. Medicine was in an equally deplorable condition and cases of poisoning through ignorance or negligence were by no means unknown. Individual efforts to secure a correction of the conditions which were so graphically described by several of their number, as will be shown later, were of no avail. The Milwaukee representatives at the State Legislature either flatly refused to have anything to do with the matter or said it would be of no avail to make an attempt because it would be construed as "class-legislation" by the general public and on account of the opposition it would meet with on the part of the druggists in the smaller towns of the interior.

Things seemed to go from bad to worse. Correction through state legislation seemed impossible at least for the time. The next best thing, therefore, was to effect an organization of those who had the wellfare of their calling at heart and to ultimately accomplish through education and organized effort that in which the individual failed.

This sentiment crystallized in an invitation extended by Mr. Johannes Kienth to a small number of personal friends and acquaintances to meet at his drug store corner Third and Sherman Sts. A meeting was held, Mr. Kienth was elected temporary president and Mr. Fr. Roehmheld temporary secretary, and the situation was discussed informally. An incomplete programme was arranged and the secretary was instructed to make the same known through the daily papers and to invite all who were qualified according to the temporary programme to appear at a meeting to be held the following Monday at the St. Charles Hotel. This meeting apparently was never held, but at the time at which this meeting was to be called to order a petition asking for pharmaceutical legislation was read at the meeting of the Common Council. Strange as it may seem at first sight this petition was not signed by a single one of the persons who were present at Mr. Kienth's store and who had made known to the citizens of Milwaukee their intention to improve the condition of pharmacy in that city.

The explanation is simply this. Mr. Roemheld made his report, as requested, in the "Seebote." [*Document 1.*] The editor, under the heading of "Tageschronik," comments semi-editorially on the new movement. Although he disowns any responsibility for the style in which the communication was written, he on the whole comments favorably on the organization of the new Milwaukee Pharmaceutical Society and its good intentions. [*Document 2.*] Other German papers were requested to take notice of the communication, which was done by the "Banner" [*Document 3.*] and by the "Germania" [*Document 4.*]. The "Evening Wisconsin" also took notice of this meeting [*Document 5.*], whereas the "Sentinel" apparently did not. This communication seems to have attracted considerable attention on the part of druggists as well as others. More information seems to have been called for and this was supplied officially by Mr. Kienth in the "Herold" on the following Friday, Sept. 17. [*Document 6.*] With the aid of a drastic illustration, attention is called to the reckless manner in which persons are allowed to practice pharmacy. This is to be changed as far as the members of the new organization are concerned. They are to have a reasonable education and training or should have had at least fifteen years of experience as prescription druggists. It is also clearly stated that the society hopes to establish a school with competent teachers.

Document 1.

[*Seebote*, Dienstag d. 14. Sept. 1875. (p. 4, col. 6.)]

(Eingesandt).

Bei der gestrigen Versammlung der prominentesten deutschen Apotheker Milwaukee's, Zwecks zum Schutz des Publikums Missgriffen und fahrlässigen Verkauf von Seiten nicht wissenschaftlich gebildeten Apothekenbesitzern und Gehülfen und den dadurch gefährdeten guten Ruf des Apothekerstandes zu schützen, wurde einstimmig der Beschluss gefasst, sich zu korporiren unter dem Namen "Milwaukee Pharmaceutical Society" und pro-tempore zur Wahl der Beamten geschritten.

Gewählt wurden als Präsident:
J. Kienth,
als Sekretär: Fr. Roemheld.

Der Verein macht sich zur Pflicht das Publikum gegenüber durch Unwissenheit und Fahrlässigkeit entstehende Missgriffe, durch Regelung des Verkaufs von starkwirkenden und gefährlichen Droguen zu schützen durch nur Anstellung von wissenschaftlich gebildeten und examinirten Gehülfen, Hebung der pharmaceutischen Interessen durch festes einiges Zusammenhalten unter sich und Regelung der Verhältnisse der Prinzipale und Lehrlinge resp. Gehülfen zu einander herbeizuführen.

Mitglieder des Vereins können solche werden die ein Examenzeugniss eines Staatscolleges oder einer dazu autorisirten Commission Americas oder irgend eines auswärtigen Staates nachweisen oder den Beweis führen können einer fünfzehnjährigen absoluten Recepturthätigkeit.

Der Verein ladet hiermit alle die Herrn Apotheker die nach den oben erwähnten Paragraphen einzutreten berechtigt sind, freundlichst ein sich zu betheiligen und bei der am Montag den 20. hujus stattfindenden Versammlung im Grand Central Hotel zu erscheinen.

Im Namen des Vereins,
Otto A. Thiele
C. Annecke
Rud. Wiese
J. Kienth, Präs.
Wm. Ritmeier
Louis Meyer
Fr. Roemheld, Secret.
Aug. v. Trott
Fr. Ladwig
F. Niedecken.

Deutsche Blätter wollen gef. kopiren.

Document 2.

[*Seebote*, Dienstag d. 14. Sept. 1875. (p. 4, col. 1.)]

Verein der hiesigen Apotheker.

Wie unsere Leser aus einem "Eingesandt" an anderer Stelle ersehen (für dessen Stylisirung die Redaktion des

„Seebote" jedoch nicht verantwortlich ist), hat sich gestern Abend eine Anzahl unserer prominentesten Apotheker zu einem Verein konstituirt, welcher den lobenswerthen Zweck verfolgt, das Publikum gegen Missgriffe ungehörig gebildeter Apothekergehülfen zu schützen und in den hiesigen Apotheken nur Gehülfen zu beschäftigen, die über eine fachmännische Ausbildung genügende Zeugnisse vorlegen können. Dieser Zweck verdient gewiss alle Anerkennung und das Publikum wird gewiss die Entstehung eines solchen Vereins mit Freuden begrüssen. Wenn wir in Milwaukee und im Allgemeinen nicht grossen Grund haben, über den Mangel an fachmännischer Bildung seitens unserer Apotheker Klage zu führen, da unsere Apotheken meist sich in Händen von tüchtigen deutschen Apothekern befinden, so verdient dieser neuer Schritt immerhin das grösste Lob, indem das Publikum durch eine derartige Organization um so wirksamer gegen etwaigen Schaden geschützt wird. Und in welchem Geschäft sollte mit mehr Vorsicht verfahren werden, als gerade in der Apotheke?

Dieser Schritt unserer Apotheker verdient in allen grösseren Städten in unserem Staate und ausserhalb desselben Nachahmung und wird dieselben zweifelsohne mit der Zeit zur Folge haben.

Der Verein wird sich gesetzlich inkorporiren lassen und hat den Namen "Milwaukee Pharmaceutical Society" angenommen.

Document 3.

[*Banner und Volksfreund*, Mittwoch d. 15. Sept. 1875 (p. 4, col. 4.)]

Die Apotheker organisiren sich.

Am Dienstag hielten eine Anzahl hiesiger Apotheker eine Versammlung, in welcher ein Apothekerverein gegründet wurde.

Der Verein bezweckt, das Publikum gegen Missgriffe beim Verkauf von Medikamenten zu schützen und als Gehülfen in den zum Verein gehörigen Apotheken nur geprüfte Leute anzustellen. Der Verein nahm den Namen „Milwaukee Pharmaceutical Society" an und erwählte zeitweilig die folgenden Beamten:

Präsident — J. Kienth,
Secretär — Fr. Roemheld.

In dem uns zur Veröffentlichung übergebenen Berichte heisst es weiter:

Der Verein macht es sich zur Pflicht, das Publikum gegen Unwissenheit und Fahrlässigkeit beim Verkaufe von starkwirkenden Droguen zu schützen, die Hebung der pharmacentischen Interessen durch festes einiges Zusammenhalten unter sich und Regelung der Verhältnisse der Prinzipale und Lehrlinge, resp. Gehülfen zu einander herbeizuführen.

Mitglieder des Vereins können Apotheker werden, die ein Examenszeugniss eines Staatscolleges oder einer dazu authorisirten Commission Amerikas oder irgend eines auswärtigen Staates nachweisen oder den Beweiss über eine fünfzehnjährige absolute Recepturthätigkeit beibringen können.

Der Verein ladet hiermit alle die Herren Apotheker, die nach den oben erwähnten Paragraphen einzutreten berechtigt sind, freundlichst ein, sich zu betheiligen und bei der am Montag den 20. d. stattfindenden Versammlung im Grand Central Hotel zu erscheinen.

Im Namen des Vereins.

[Same signatures as under Document 1.]

Document 4.

[*Germania*, Mittwoch, 15. Sept., 1875. (p. 3, col. 5.)]

Die deutschen Apotheker haben einen Verein unter dem Namen „Milwaukee Apotheker-Verein" gegründet.

J. Kienth wurde zum Präsidenten und Fred. Roemheld zum Secretär ernannt. Zweck des Vereins ist, Schutz des Publikums vor Unwissenheit und Sorglosigkeit bei dem Verkaufe gefährlicher Medizinen und Aufstellung von Bestimmungen, welche für Apotheker und deren Gehülfen von Nutzen sind. Mitglieder des Vereins sind die Herren Otto A. Thiele, C. Annecke, Rud. Wiese, J. Kienth, Wm. Rittmeier, Louis Meier, Fred. Roemheld, Aug. v. Trott, Fred. Ladwig und Franz Niedecken.

Document 5.

[*Evening Wisconsin*, Wednesday, Sept. 15, 1875. (p. 4, col. 1.)]

German Druggists.

A meeting of the German druggists of the city was held last evening. J. Kienth was selected President and F. Roemheld Secretary. Among those present were: Otto A. Thiele, C. Annecke, Rudolph Wiese, J. Kienth, William Ritmeier, Louis Meyer, Frederick Roemheld, August von Trott, Frederich Ladwig and Frederick Niedecken.

The association is to be known as the "Milwaukee Pharmaceutical Society" and has for its object the protection of the public against ignorance and carelessness, and to provide rules for the benefit of druggists and their assistants. The next meeting is to be held at the Grand Central Hotel next Monday evening.

Document 6.

[*Herold*, Freitag d. 17. Sept. 1875. (p. 3, col. 6.)]

(Eingesandt).

Die mir vielfach zugehenden Anfragen von Apothekern wie Laien, die Intentionen der Milwaukee Pharmaceutical Society betreffend, mögen im Folgenden ihre Beantwortung finden:

Es ist der feste Entschluss des Vereins, die Paragraphen seiner Constitution mit eiserner Consequenz durchzuführen. Es kann dabei weder vom einem Puppenspiel noch von einer Geschäftsreklame die Rede sein.

Hier gilt es das Wohl und Wehe unserer Mitbürger. Mögen die Dummen, die nie alle werden, am Geldbeutel sich schädigen lassen, so viel sie wollen, das verhindern zu wollen ist eine Unmöglichkeit, denn gegen Dummheit kämpfen selbst Götter vergebens. Die Gesundheit aber soll nicht mehr ein Opfer betrügerischer, habgieriger Unwissenheit sein. Dass der Verein den Nachweis eines bestandenen Examens verlangt, ist sehr in der Ordnung. Dass der Verein auch eine Examinations-Commission zur Prüfung etwaiger sich meldender Candidaten einsetzen wird ist selbstverständlich. Dass auch Apotheker, die eine absolute fünfzehnjährige Receptur Thätigkeit hinter sich haben, als Mitglieder aufgenommen werden können, ist gewiss einem Jeden einleuchtende, gerechte und billige Nachsicht, den älteren, erfahrenen Apothekern gegenüber, denn eine fünfzehnjährige Praxis giebt dem Publikum eine genügende Garantie für die Befähigung des Apothekers.

Es ist ferner die etwas weiter liegende Absicht, eine pharmazeutische Schule mit dem Verein zu verbinden, und werden die geeigneten Lehrkräfte für die einzelnen Fächer sicher gefunden werden, da tüchtige Fachleute, gediegene Aerzte und gewandte und gebildete Techniker dazu erkoren werden sollen. Vorauszusehen war wohl ein Wehgeschrei, ein Wuthgeheul vieler pharmazeutischer Freibeuter, die leichtsinnig genug ein so verantwortliches Geschäft auf ihre Schultern genommen haben.—

Wie schauderhaft leichtsinnig viele dieser sich Apotheker nennenden Geschöpfe in's Geschirr gehen, beweise folgende Thatsache.—

Ein junger Mann kommt in die Apotheke eines renommirten Apothekers mit den Worten: „Say, sind sie der Boss?" „Ja, ich habe die Ehre." „Say, wie lange thät's mich nehmen, den Trade zu lernen?" „Wenn Sie fleissig sind zum mindesten 3 bis 4 Jahre." „Ach was, ich will selbst einen Store anfangen. Ich denke in 4 bis 6 Monaten kenne ich all die Bottles und kann auch Prescriptions machen." Sagte es und verschwand und in 6 Monaten hatte er richtig seine Apotheke. Wo, was, und wie viel er gelernt, darüber schweigt des Sängers Höflichkeit.

Ich könnte solcher Beispiele mehrere anführen, glaube aber, dass eines genügt, das Publikum davon zu überzeugen, dass Abhülfe der bestehenden Misstände dringend geboten sei.

Johannes Kienth.

(To be continued.)

Chemical Bibliography of Morphine. 1875—1896.

By *H. E. Brown*, B. S.*

[In this bibliography it is undertaken to index original articles making record of real chemical research, and to outline the scope and result of each investigation. The outlines or abstracts have been made by Mr. Brown from the original publications, in all cases except where the paragraph is marked with a star. For the convenience of workers who need the original in full, but have access only to limited libraries, citations are given to as many republications of an article as practicable, the first citation indicating the original publication. The arrangement of the bibliography itself is chronological as far as possible, with the provision of an index of authors and one of subjects.

The chemical literature of morphine is especially difficult to compass, both as to analytical method and as to chemical structure. In both of these respects, also, morphine is a representative of related alkaloids. For these reasons the publication of the bibliography seems to be justified. *A. B. Prescott.*]

List of Periodicals consulted.

The following periodicals were examined carefully for articles upon the subject of the bibliography, in each case, from the year 1875 to the end of 1896:

Journal of the Chemical Society.
Berichte der deutschen Chemischen Gesellschaft.
Bulletin de la Société chemique de Paris.
Chemische Centralblatt.
Pharmaceutical Journal and Transactions.

The following were consulted upon references:

Annalen der Chemie (Liebig).
Comptes rendus de l'Académie des Sciences.
Journal of the American Chemical Society.
American Chemical Journal.
Archiv der Pharmacie.
Journal für praktische Chemie.
Annales de Chimie et de Physique.
Chemical News.
Zeitschrift für analytische Chemie.
Deutsche Chemiker-Zeitung.
Pharmaceutische Centralhalle.
Gazzetta chimica italiana.

Beckett, G. H., and Wright, C. R. A. 1875.

J. Chem. Soc. 13, p. 15; Ber. 7, p. 1651.

Action of Organic Acids and their Anhydrides on the Natural Alkaloids.

When anhydrous morphine is heated to 130° for five or six hours with twice its weight of butyric acid, a reaction occurs exactly similar to that produced with acetic acid, $C_{34}H_{38}N_2O_6+2(C_4H_7OOH)=2H_2O+C_{34}H_{36}(C_4H_7O)_2N_2O_6$. In this reaction a non-crystalline and a crystalline base are formed at the same time, which are in all probability *α*- and *β*-dibutyryl morphine respectively.

Beckett, G. H., and Wright, C. R. A. 1875.

J. Chem. Soc. 13, p. 20; 15, pp. 23 and 312; Ber. 7, p. 1651, and 8, p. 119, and 9, p. 508.

Action of Organic Acids and Their Anhydrides on the Natural Alkaloids.

Butyric anhydride with morphine yields tetrabutyryl morphine. This upon boiling gives the dibutyryl compound and butyric acid is liberated.

Acetyl-butyryl-morphine is formed by treating morphine with equivalent quantities of acetic and butyric acids.

Morphine heated to 130° with benzoic anhydride forms tetrabenzoyl morphine. This latter compound upon boiling with water and alcohol generates dibenzoyl morphine and benzoic acid.

The introduction of acetyl groups into tetramorphine almost wholly deprives it of basic characteristics.

With ethyl iodide the following compounds have been formed: Tetra-acetyl-morphine-ethiodide, diacetyl-morphine-ethiodide and its isomers tetra-butyryl-morphine-ethiodide, dibutyryl-morphine-ethiodide, tetrabenzoyl-morphine–ethiodide and diacetyl–dibenzoyl–morphine-ethiodide.

Sodium ethylate on acetylated morphine does not produce ethylated bases; but the alkaloid is in part reproduced and in part polymerized.

Beckett, G. H., and Wright, C. R. A. 1875.

J. Chem. Soc. 13, p. 25; Ber. 7, p. 1651.

Benzoic and Acetic Anhydrides on Morphine Derivatives.

An attempt was made to replace benzoyl by acetyl and vice versa. No noticeable action could be brought about.

Beckett, G. H., and Wright, C. R. A. 1875.

J. Chem. Soc. 13, p. 25; Ber. 7, p. 1651.

Action of Benzoic Anhydride on *α*-Diacetyl Morphine.

α-diacetyl-dibenzoyl-morphine has been prepared and has the following composition: $C_{34}H_{34}(C_2H_3O)_2(C_7H_5O)_2N_2O_6$.

Bauer, H. R. 1875.

J. Chem. Soc. 13, p. 467; Pharm. J. Trans. 5, p. 422.

Iodine Compounds of Morphine.

The following crystalline compounds have been found by the author: $2(C_{17}H_{19}NO_3)_3I$, $C_{17}H_{19}NO_3.HI_4$ and $(C_{17}H_{19}NO_3.HI.3H_2O)$.

Beckett, G. H., and Wright, C. R. A. 1875.

J. Chem. Soc. 13, p. 689; Ber. 8, p. 778.

Action of Polybasic Acids on Morphine and Codeine.

If morphine be heated with succinic acid to one hundred and eighty degrees, a reaction according to the following equation takes place: $C_{34}H_{38}N_2O_6+2C_2H_4(COOH)_2=2H_2O+C_{34}H_{36}(COC_2H_4COOH)_2N_2O_6$. This compound is both basic and acidic. Its salts with acids are more stable than those with bases. The substance crystallizes from 80 p. c. alcohol and gives with hydrochloric acid $C_{36}H_{40}(C_4H_5O_3)N_2O_6.2HCl.2H_2O$.

Camphoric acid acts upon morphine in a similar manner, giving a compound which is both basic and acidic in its nature.

With oxalic acid and morphine heated to 150°, CO and CO_2 are produced, while the base is at the same time polymerized into tri- and tetra-morphine.

Vogt, E. 1875.

Arch. der Pharm. (3), 7, p. 23; J. Chem. Soc. 1875, (1), p. 280; Chem. Centrbl. 1876, p. 133.

Occurence of Morphine in the Excreta.

The author examined the urine and fæces of a man, who had been long accustomed to daily taking large doses of the alkaloid. No morphine was found in the urine, but weighable quantities were found in the fæces.

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* Prepared under the direction of A. B. Prescott for the use of the Special Committee of Research, Am Pharm. Association.

Hilger, A. 1875.

Arch. der Pharm. (3), 6, p. 509; J. Chem. Soc 1875, (1), p. 404.

Combinations of Several Alkaloids with Iodine.

The author shows that H. R. Bauer's published work in 1874 was only a repetition of that done by Jorgensen in 1869. Furthermore the author in the same year published a paper in which all the results of Bauer were anticipated.

Husemann, A. 1875.

Arch. der Pharm. (3), p. 231; J. Chem. Soc. 1875, (1), p. 777; Chem. Centrbl. 1875, p. 264.

Husemann's test having been called in question by Mohr, the author states that 1/100 mgm. of morphine may be detected by this test.

Konrad, Max. 1875.

Chem. Centrbl. 1875, p. 75.

Combinations of Acetone with Alkaloids.

The author gives a method for the preparation of morphine acetone.

Selmi, F. 1875.

Ber. 8, p. 1198.

Reagents for alkaloids.

The author recommends the following reagents for the systematic identification of the alkaloids: iodine in hydriodic acid, auric bromide, sodium auric hyposulphite, potassium auric iodide, potassium platinic iodide, lead tetrachloride and manganese superoxide hydrate in sulphuric acid.

Schmidt, E. 1875.

Ann. 180, p. 287; Ber. 8, p. 1267; J. Chem. Soc. 15, p. 94.

Action of Hydrogen Sulphide on the Alkaloids.

The alkaloids when treated with hydrogen sulphide form compounds of the base with sulphur, and sulphur is at the same time separated.

On account of the instability of the compounds they are very difficult to obtain in a pure condition.

Selmi, F. 1876.

Gazz. chim. ital. 5, p. 255; J. Chem. Soc. 14, p. 113; Ber. 1876, p. 195.

On the Detection of Poisonous Alkaloids.

Two new reagents are given for the detection of poisonous alkaloids: Potassio-platinic iodide and potassio-auric iodide.

A test is also given for distinguishing opium alkaloids by means of iodised hydriodic acid, and tests by gold bromide, and other reagents.

The reaction with morphine is the most delicate and characteristic.

Naglevoort, J. B. 1877.

Arch. der Pharm. (3), 9, p. 249; J. Chem. Soc. 17, p. 230; Chem. Centrbl. 1876, p. 713.

Ammonium Sulphomolybdate as a Test for Alkaloids.

Distinctive color reactions with the alkaloids are produced with this reagent.

Cleaver, E. L. 1876.

Pharm. J. Trans. 7, p. 240.

Report on the Assay of Opium for Morphia.

The author discusses fully the conditions required for an accurate determination of morphine in opium, and then criticises a number of the existing methods. He shows wherein they are at fault and suggests improvements in some of them.

Proctor, B. S. 1876.

Pharm. J. Trans. 7, p. 244.

Note on the Assay of Opium.

The author gives the results (at which he has arrived after long experience) as to best methods to be pursued in the determination of morphine in opium.

Prescott, A. B. 1876.

Pharm. J. Trans. (3), 6, p. 404; J. Chem. Soc. 1876, (1), p. 403.

Comparative Determinations of the Solubilities of Alkaloids in the Crystalline, Amorphous and Nascent States.

Purified ether, amylic alcohol and benzene were used as solvents. The author gives in tabulated form the number of parts of solvent required for one part of the alkaloid.

In general the crystallised alkaloid requires more of the solvent than it does in the amorphous or nascent states.

Merck, M. 1876.

Pharm. Ztg. (3), 1876, 325*; Pharm. J. Trans. 7, p. 229.

Notes on Morphine Acetate.

This salt is unstable, decomposing into acetic acid and a basic salt.

Commercial acetate of morphia will not dissolve without coloration in concentrated sulphuric acid.

Hager, H. 1876.

Pharm. Centrlh. 16, p. 444; Chem. Centrbl. 1876, p. 90; J. Chem. Soc. 16, p. 748.

Testing of Quinine Salts for Strychnine and Morphine.

The reagents used in this test are pure concentrated sulphuric acid, crystals of potassium dichromate and silver nitrate.

When the two reagents last named are added to the sulphuric acid solution of morphine, a reddish-brown coloration is produced.

Krause, G. 1876.

Arch. der Pharm. 5, 507; J. Chem. Soc. 1, p. 777.

Examination of the *Fructus Papaveris* for Morphine, Narcotine and Meconic Acid.

Morphine was found in weighable quantities in this plant.

Teschenmacher, E. F. 1877.

Chem. News 35, p. 47; J. Chem. Soc. 17, p. 231; Chem. Centrbl. 1877, p. 249.

Determination of Morphine in Opium.

Previous methods having proved to be unsatisfactory, due no doubt to a lack of minuteness in the description of the plan to be followed, and also a lack of painstaking investigation as to the probable sources of error, a new method is proposed and accurately described. The use of alcohol for extracting the opium is avoided and meconic acid is separated as soon as possible in order to prevent a precipitate of basic meconate of morphine.

Lindo, D. 1877.

Chem. News, 36, p. 228; J. Chem. Soc. 17, p. 906; Ber. 2, p. 809.

Action of Sulphuric Acids and Oxidizing Agents on Morphine.

All oxidizing agents when added to a solution of morphine, which has been treated by warming with concentrated sulphuric acid, allowed to cool and then diluted, give a deep red coloration.

Codeine and narcotine act in a similar manner.

Selmi, F. 1877.

Gazz. chim. ital. 4, p. 32; J. Chem. Soc. 31, p. 110; further Ber. 11, p. 809. Also a monograph entitled "Nuovo processo generale per la ricerca della sostanza venefiche." Bologna, 1875.

Modification of the Process of Extracting the Poisonous Alkaloids from the Viscera.

On account of the acidulated alcoholic extract of the alkaloids undergoing an alteration during evaporation as ordinarily conducted, the author gives a new method by means of which these errors are avoided.

(To be continued.)

MONTHLY REVIEW.

Chemistry.

Action of Tannin and Gallic Acid on some Alkaloids.

According to W. O. de Coninick, an aqueous solution of tannin immediately precipitates pure and anhydrous nicotine, and an alcoholic solution precipitates nicotine from its solution in alcohol. Ethereal solutions behave in the same way. Gallic acid has no action on pure nicotine, but in presence of water a deep orange-red coloration is developed more rapidly than with tannin.

With cicutine or its aqueous solutions, neither dry tannin nor dry gallic acid produces any reaction, but with the aqueous solutions a blood-red color soon develops. An aqueous solution of tannin precipitates pure and anhydrous cicutine, and alcoholic or ethereal solutions precipitate the corresponding solutions of the alkaloid. The reactions are somewhat sensitive, but nicotine is precipitated by tannin from much more dilute solutions than cicutine.

[J. C. S. 72, p. 447; from C. r. 124, p. 773.]

Apparatus for the Liquification of Air and for the Production of Low Temperatures.

This apparatus was reported upon by the inventor, Prof. Linde of München, at the fourth annual meeting of the German Electrochemical Society, held at München, This new machine consists in one air compresser and two parts for the equalization of temperature, and is capable of producing several litres of liquified air per hour. The problem of producing large quantities of liquified air in a cheap and simple manner seems now to be solved. The manner of producing the cold consists in this machine, in opposition to those of Siemens and Solvay, in that heat is taken from the gas to be liquified, by doing internal work. The liquified air thus produced was passed around in test tubes during the lecture. Temperature—190°.

French Oil of Basil.

This oil, according to J. Dupont and J. Guerlain has a sp. gr. of 0.914 at 15°, and a rotation of — 7° 40′ in a 100 mm. tube. When distilled under atmospheric pressure, four-fifths pass over between 190—220°, a brown resinous mass remaining in the distilling flask, and on further fractionation, two main fractions are obtained, the one boiling at 195—200°, the other at 205—215°. The former is an oily, refractive liquid possessing the odor of lævorotatory linalool, and having the formula $C_{10}H_{18}O$; the following properties are recorded: sp. gr. = 0.8552 at 15°; $[\alpha]_D = -14.03°$; index of refraction, $n_D = 1.4565$; molecular refraction = 49. It combines with 4 atoms of bromine, giving an uncrystallizable liquid product, and, on heating with acetic anhydride, an acetate boiling at 128° (14 mm.), which on saponification with alcoholic potash, yields geraniol, boiling at 115—117° (15 mm.). This fraction, therefore, consists of lævorotatory linalool. The fraction boiling at 205—215° had the odor of estragol, and exhibited a rotation of — 6° 40′ in a 100 mm. tube. Even after treatment with alcoholic potash, in order to free it from ethers, and further fractionation, it was found impossible to obtain a product of definite composition. Its odor, its boiling point, and the formation of methylic iodide on treatment with hydriodic acid, having rendered it probable that this fraction consisted chiefly of estragol, it was heated with concentrated alcoholic potash for 24 hours, and after treatment with water and extraction with ether, the product was fractionally distilled. The main fraction boiling at 225—230°, instantly solidified on the addition of a crystal of anethol, and melted, after drying between filter paper, at 21°. The second fraction, therefore, of the oil consisted of estragol (paramethoxyallylbenzene).

[J. C. S. 72, p. 429; from C. r. 124, p. 400.]

Botany and Pharmacognosy.

Cicuta vagans Greene.

Prof. U. P. Hedrick reports frequent poisoning of stock and not rarely of human beings also by the thickened root of a near relative of our socalled "wild parsnip", *Cicuta maculata* L. The western species, *C. vagans* Greene, very closely resembles the plant of the more eastern localities, but seems to be confined to the West. It occurs not only in Oregon but also in N. California, Washington and British Columbia. Of its deadly nature there is no doubt, a piece of the size of a walnut being found by experiment sufficient to kill a cow. Death occurs usually in a few hours. Of interest is the fact that the root seems to possess poisonous properties only when dormant during the winter months and in the early spring for a short time after growth has begun. No remedy for cicuta poisoning was found to be reliable and efficient.

[Bull. 46. Oregon Experiment Station. June 1897.]

The Camphor Tree.

The Division of Botany of the U. S. Department of Agriculture has issued a circular on the camphor tree. The main facts concerning the plant, its products and the methods of obtaining them are concisely told.

The camphor tree, while grown in the United States, has but a limited distribution, as indicated by an outline map. A strip along the Gulf, including all of the state of Florida, the coastal parts of California south of San Francisco and limited areas in southern Arizona and along the Rio Grande River comprise the camphor-raising regions.

A table indicating the imports of camphor for the last ten years shows that the United States importations of this commodity have decreased materially in quantity during this period, but increased slightly in total value owing to the increased price per pound. In 1887, this country imported 2,873,184 pounds of crude camphor, valued at $352,861 and 307 pounds of refined camphor, valued at $45. In 1896, 943,205 pounds of the crude article valued at $328,457 and 155,027 pounds of refined camphor valued at $52,811 was imported.

[Circular 12, Div. of Botany, Dept. of Agriculture. 1897.]

Echinacea.

The following quotations are taken from an address by Prof. J. U. Lloyd.

Conspicuous among those who have by rational experimental methods enriched the materia medica of the world, stands the section in medicine with which my life has been closely affiliated. The world has profited by our experimentation; the American materia medica has been more largely developed by us than by others. Empiricists in the sense that we believe in careful investigation, we have labored more than half a century, and still observing, experimenting, studying the actions of drugs, we go on in the good work. Be it said to our credit, that we are not ashamed of the word experiment; the term empiricist has for us no terror.

Discovery of Echinacea.

In the fall of 1885, I received from Dr. H. C. F. Meyers, of Pawnee City, Nebraska, the root of a plant that he wished named. He stated that he used it in making "Meyers' Blood Purifyer," and his letter head heralded that remedy in large type. At the same time he sent Prof. John King a bottle of the preparation, making for it the most exaggerated claims. King informed Dr. Meyers that he could do nothing with a secret mixture; that if he wished it presented to the medical profession through him, the drugs entering into its composition must be public. At the same time I wrote him that the plant could not be determined from the root alone. Under date of June 7th, 1886, Dr. Meyers then sent me a large box of the root, and again, Sept. 28, 1886, mailed the whole plant. This proved to be echinacea angustifolia D. C. Still the exaggerated claims of Dr. Meyers in behalf of the remedy, which he claimed would cure nearly everything from rattle-snake bite to typhoid fever, led me to discredit it entirely. Not so with Prof. King, who proposed to sift the chaff from the grain, and for whom I at once instituted several series of experiments with echinacea in a pharmacal direction.

Introduction to the Profession.

By advice of Dr. King, specimens of his preparation and of the drug were submitted by Dr. Meyers to other Eclectic physicians, among whom was Dr. I. J. M. Goss, of Atlanta, Ga., who became an enthusiastic advocate of echinacea—almost as enthusiastic as was Dr. Myers; and Prof. H. T. Webster, M. D., of Oakland, Cal., who used the preparation made by me for King, and who then advocated it highly in his Dynamical Therapeutics.

In 1887, Prof. King wrote a paper (E. M. Journal, p. 209) on the drug, and in 1893, C. G. Lloyd (Eclectic Annual, Vol. IV., p. 332), who named the plant for Dr. Meyers, contributed a paper on the drug. During this time and afterward as well, Prof. Goss mentioned the remedy frequently and under the advice and authority of Prof. King, who ultimately became a strong advocate of its virtues. Physicians generally wrote frequent articles for the journals, and at the present day, eleven years after it was brought to our attention, the drug may be said to be established in Eclecticism.

Characteristics.

Echinacea root has a brown or brown-red color. It is much wrinkled longitudinally, and the folds of the shrunken epidermis often twist about the root in spiral form. When sliced transversely, the yellowish medullary rays are seen to be separated from each other by a greenish pulp, and when the dried root is broken the fracture presents the appearance of having been afflicted with dry rot. Upon chewing the root of prime echinacea, a sweetish taste presents itself, which, upon prolonged chewing, becomes acrid and finally tingling, which remains long to affect the tongue. This sensation reminds us of aconite, but it is devoid of the benumbing quality of aconite. Indeed, more than one physician has inferred from this similarity of taste, that by mistake aconite had been sold under the echinacea label. In early experience with the drug I found insipid, tasteless lots that proved worthless in medicine. These specimens all came from low lands east of the Mississippi river, for the plant is not confined exclusively to the West. Unquestionably those who depend on the crude root as a standard, will find great variation in product.

Echinacea contains minute amounts of a colorless alkaloid, which, however, does not constitute the therapeutical qualities of the drug. It contains much sugar and large amounts of coloring matters which prove injurious if allowed to remain in its preparations. The sensible constituent is a colorless organic substance of acid reaction, which is intensely acrid and persistent—distressingly so in a pure condition. It exists in prime echinacea in minute amounts, less than one half of one per cent.

New Remedies.

Anilipyrine.

This is the name given by Gilbert and Yvon to a new antipyretic product by melting together 1 p. antifebrine and 2 p. antipyrine. Anilipyrine is readily soluble in water and is weakly toxic. It reduces the body temperature to a greater extent than antipyrine, but less than antifebrine. It is especially recommended in influenza and polyarthritis, hemicrania and neuralgia. Single dose, 0.5 g.; dose per day, 1—2 g.

[Ph. Centralh., 1897, p. 501.]

Eka-Iodoform.

This substitute for iodoform was first employed with good success by Dr. Thomalla in all cases where iodoform had hitherto been used. According to the manufacturers, the Chemische Fabrik auf Actien, Berlin, this new remedy is a mixture of iodoform and paraform. While having decided antiseptic properties, eka-iodoform is said to never produce irritation.

[Ph. Centrh., 1897, p. 465.]

Guiaiaquine.

This is a substitute for guaiacol, recommended because free from the odor and caustic properties of the latter. It is obtained by interaction of equimolecular quantities of guaiacolsulfonic acid and quinine. Guaiaquine ($C_6H_4O_2CH_3HSO_3.C_{20}H_{24}N_2O_2$) is described as a yellowish powder, having a sour and bitter taste, readily soluble in water, alcohol and dilute acids.

[Ph. Centralh., 1897, p. 501.]

Literary.

Books and Pamphlets Received.

Missouri Botanical Garden—St. Louis. Botanical Observations on the Azores. By Dr. William Trelease, Director. One vol., pp. 220, with 55 plates. 1897.

American Pharmaceutical Association.—Report of the Proceedings of the Seventh Pharmaceutical Congress, held at Chicago, August 21, 22, 23, 1893. One vol., pp. xxx, 102. 1897.

Leopold Voss—Hamburg. Praxis der Harnanalyse. Anleitung zur chemischen Untersuchung des Harns, nebst einem Anhang: Analyse des Mageninhalts, von Dr. Lassar-Cohn. Brochure, pp. 38. 1897. M. 1.00.

Author.—Ueber Condensationsprodukte des Cyclo-Methyl-Hexanons. Inaugural-Dissertation zur Erlangung der Doktorwürde der hohen phil. Fakultät d. Georg-Augusts Universität zu Göttingen vorgelegt von John Thompson Dorrance aus Bristol, Pa. Pamphlet, pp. 87. 1897.

F. B. Power*—London. Création d'un laboratoire de vérification générale des médicaments dans tous les pays, par M. de Ridder, pharmacien à Anvers. Pamphlet, pp. 6.

——Sur la convenance de la promulgation d'une Pharmacopée universelle, par José D. Morales, pharmacien et chimiste à Mexico. Pamphlet, pp. 3.

——De la préparation et de la vente des sucs organiques, par M. A. Denaeyer. Pamphlet, pp. 32.

——L'inspection des pharmacies au point de vue de la pureté des médicaments, par M. Schamelhout, pharmacien à Bruxelles. Pamphlet, pp. 4.

——Dans l'état actuel de la science, n'est-il pas désirable d'exiger dans les médicaments, drogues, et leur préparations, une teneur normale en principes actifs? Rapport de M. le Dr. F. Ranwez. Pamphlet, pp. 10.

——De l'institution d'un conseil supérieur de chimie légale, par M. Louis Huart, pharmacien à Louvain. Pamphlet, pp. 8.

——Prescriptions et mode d'emploi des médicaments, par M. J. Breuzelmans, pharmacien à Anderlecht, Bruxelles. Pamphlet, pp. 13.

——Sur le titrage des drogues et des préparations galéniques, par M. Duyk. Pamphlet, pp. 31.

——Moyen pratique et légal d'éviter les rabais sur la prix marqué des specialités. Résumé du rapport de la commission composée de M.M. Chaux, Dognon et Languepin, du Syndicat des pharmaciens de la Charente, par M. J. Raymond. Pamphlet, pp. 4.

——Analyse des eaux alimentaires. Rapport de M. Charles Pottiez, pharmacien à Fontaine-l'Evêque. Pamphlet, pp. 19.

——Les spécialités pharmaceutiques, par M. Aimé Bekaert, pharmacien. Pamphlet, pp. 7.

——Réglementation de l'exercise de la pharmacie. Rapport de M. Léon Gosset, pharmacien à Ixelles. Pamphlet, pp. 43.

Author.—Medical Botany. Address before the Section of Materia Medica, Pharmacy and Therapeutics at the Philadelphia meeting of the Am. Med. Ass'n. By Prof. Wm. Trelease, Director of the Missouri Botanical Garden. Pamphlet, pp. 12.

Author.—Proprietary vs. patent medicines. Reprint from the Transactions of the Wis. Med. Soc.; and Carvacrol iodid, reprint from the Journ. of the Am. Med. Ass'n., by Dr. A. H. Cohn, Milwaukee.

Author.—A plea for a uniform diastase test. By Dr. C. C. Fite, New York. Reprint from the Journ. of the Am. Med. Ass'n. Pamphlet, pp. 8.

Reviews.

Lehrbuch der physiologischen Chemie mit Berücksichtigung der pathologischen Verhältnisse. Für Studirende und Aerzte. Von Richard Neumeister, Dr. med. et phil., a. o. Professor der physiologischen Chemie an der Universität Jena. Zweite, vielfach vermehrte und theilweise umgearbeitete Auflage. Mit einer lithographischen Tafel. Verlag von Gustav Fischer, Jena. 1897. M. 17.00; geb. M. 19.50.

At no time possibly have both physician and pharmacist been more in need of a well grounded knowledge of physiology and physiological chemistry than at present. Serum-therapy and organotherapy are not only the fashion of the hour, but each apparently has come to stay for some time at least. For a generation or two the progress of chemistry, and particularly of organic chemistry, had been so phenomenal that not only the laity, but even scientists were possessed of the notion that nothing could escape the chemical analyst. More than that, the synthetic chemist had outstripped nature. He produced new remedies much faster than she could, better than the natural ones and with unerring certainty, being independent of climatic and atmospheric conditions.

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* Dr. Power was one of the American delegates to the Eighth International Pharmaceutical Congress, at which these papers were presented.

Whereas the synthesis of new remedies is going on and much good work is being done in the pharmacologic and therapeutic study of these new comers, there can be no denying that the pendulum has begun to swing back, but not so much in the direction of vegetable remedies, as in that of animal remedies. Remedies which less than a generation ago would have been branded as products of quackery, are now elevated to a position over and above empiric therapy. Physiology and physiological chemistry have discovered facts which medicine has been quick to appropriate.

Both the proper use and the abuse of these facts, bordering on quackery if not quackery itself, make a knowledge of physiology and physiological chemistry a very essential part of the mental armamentarium of the physician and also of the pharmacist. Whereas it is true that the physician is in need of this knowledge to rationally apply it in his practice, the pharmacist is in no less need of it as a useful servant of the public. For people will come to him to purchase for self-medication those animal remedies, the advertising of which in our daily papers appeals more to a pathologic condition of the mind than of the body.

It is with pleasure, therefore, that we greet the second revised and enlarged edition of Neumeister's Lehrbuch der physiologischen Chemie. The first edition has met with so much favor, that the second may expect even a more hearty welcome, especially at this time. The book is divided into two large parts, viz. 1. Nutrition; and 2. The animal tissues and fluids.

After a general introduction on the conservation of matter and energy, and on animal and plant life, the author discusses in various chapters:— 1. The chemical processes in the animal cell, and the cell contents; 2. Aliments; 3. Ferments; 4. Digestion; 5. Resorption and the immediate fate of the resorbed material; 6. The supply of food, and the significance of food-stuffs for the organism. The second part includes the following chapters:— 7. The muscles; 8. Tissues of support; 9. The nervous system; 10. The skin, its appendages and secretions; 11. The glandular organs; 12. Egg and sperm; 13. Blood and lymph; 14. The milk; 15. Urine.

This book of almost a thousand pages is too comprehensive to allow of more than indicating its contents. Special attention, however, may be called to one or two chapters to indicate its interest and usefulness to the pharmacist as well as to the physician. The proper administration of medicines demands more than a common school knowledge of the physiology of digestion. Although the physician prescribes and directs, the pharmacist is frequently called upon by the patient to explain the directions which he had failed to comprehend. The correction of a poor digestion has largely become a matter of self-medication with the introduction of no small number of enzymitic preparations. The proper application of these remedies requires a knowledge of a field that has proven of special interest to chemists and biologists in recent years.

Another chapter that will possibly appeal stronger to the man with a practical turn of mind is that on urine, to which all of two hundred pages are devoted. Both the normal and pathological conditions of this excretion are discussed in detail.

Courses in medicine and especially in pharmacy are as a rule too short to permit even the elementary study of physiology or physiological chemistry. Both pharmacist and physician will find these branches interesting and profitable studies after graduation. A work like this one of Neumeister should be found in the library of every progressive pharmacist and physician. *E. K.*

Botanical Observations on the Azores. From the eighth Annual Report of the Missouri Botanical Garden. By William Trelease, Director. pp. 77–220, with 54 plates (12–66).

The paper deals largely (though not exclusively) with observations and collections made during the summers of 1894 and 1896 by the author. The first thirteen pages are devoted to observations on the geology, meteorology, cultivated plants and history of botanical work of the islands. The remainder of the paper is composed of a list of plants with occasional critical notes. A list of the principal works dealing with the botany of the island is appended. The paper will form a desirable addition to the library of the systematist. *L. S. C.*

An Illustrated Flora of the Northern United States, Canada and the British Possessions from Newfoundland to the parallel of the southern boundary of Virginia, and from the Atlantic Ocean westward to the 102d Meridian. By Nathaniel Lord Britton, Ph. D., Emeritus Professor of Botany in Columbia University and Director-in-chief of the New York Botanical Garden, and Hon. Addison Brown, President of the Torry Botanical Club. Vol. II, pp. IV, 643. Charles Scribner's Sons, New York. 1897.

When in the latter part of last year the first volume of this work was issued, the public was promised its early completion, and the appearance at this time of the second volume augurs well for the fulfillment of that promise. The second volume contains the *Portulacaceæ* to *Menyanthaceæ* inclusive and is equal in every respect to the first volume. The Review took occasion to criticize adversely the use of the duodecimal system of measurements when the first volume appeared and notwithstanding the reasons recently offered in justification by the authors it would seem that the use of the decimal system might better have been used. The early appearance of the concluding volume will be welcomed by all. *L. S. C.*

Arzneimittel welche in dem Arzneibuch für das Deutsche Reich, dritte Ausgabe, Neudruck 1895, nicht enthalten sind. Zweite Ausgabe. Bearbeitet und herausgegeben vom Deutschen Apotheker-Verein. Ein Bd., pp. VIII, 379.

The United States Pharmacopœia, like the pharmacopœias of Europe, is not a descriptive catalogue of our entire materia medica, but contains only a selected list of chemicals, drugs and preparations which are more or less generally used throughout this country. Although our pharmacopœia is not a government publication it has had the result of making preparations more uniform in all the states as far as the U. S. Pharmacopœia took cognizance of them. This naturally left a much greater number of galenicals without any standard formula for their preparation. This lack of standard was not only an annoyance to both pharmacist and physician but also a menace to the public. The American Pharmaceutical Association remedied this evil in part by the publication of the National Formulary, the first issue of which appeared in 1888.

This Formulary has not only been of great service in this country, but the idea of such a voluntary standard supplementary to the pharmacopœia apparently has met with considerable favor abroad. Following "dem Beispiele ausländischer Vereine", the German Apothecaries' Society in 1889 determined to prepare a national standard for the more important articles of the unofficinal materia medica. The Pharmacopœial Commission of the society was requested to prepare such a work, and the first edition published by the society appeared in 1891.

The book met with such favor that the edition was soon exhausted. Numerous requests for copies, as well as the publication of the "Nachtrag,' to the third edition of the German Pharmacopœia by the government, therefore, made a second edition of this "Ergänzungsbuch" or supplementary unofficial pharmacopœia, as it might be designated, desirable. The second edition of the "Ergänzungsbuch" now lies before us.

The "Ergänzungsbuch," to avoid the long title of the work, differs from our National Formulary in corresponding more to the pharmacopœia. It is in fact a supplementary unofficial pharmacopœia. Whereas the National Formulary, true to its name, contains formulas of non-official galenical preparations only, the "Ergänzungsbuch" contains many other articles of our modern materia medica. Special attention has been given to modern chemical remedies, the so-called "new remedies," whether new or comparatively old. Of these the method of preparation is not given, but the standard of purity to which they should conform. Also some of the organo-therapeutic preparations are included.

The Table of maximum doses has been revised by Prof. Lewin of Berlin. Table B contains a list of poisons (*Venena*) and table C enumerates those articles which should be preferably kept separate from the general stock of the pharmacy (*Separada*). The book is further provided with an index of synonyms and with a general alphabetic index.

The "Ergänzungsband" contains 892 items or articles and may well serve both as stimulus and model for a similar supplementary volume to our U. S. Pharmacopœia. That there is a need for such in this country beyond the National Formulary but few can doubt. Our modern materia medica changes very rapidly in large part. Besides an official pharmacopœia that will cover all demands of the pharmaceutical and medical fraternities in the United States is even less possible than in Germany. With no American unofficial standard of this kind, the German reading pharmacists of this country will find the "Ergänzungsband" of their confrères in Germany very serviceable. Whatever the shortcomings of such a work may be, for it is absolutely impossible to satisfy all sectional demands, the German Apothecaries' Society may well be congratulated upon its excellent achievement in this direction. *E. K.*

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EDITORIAL.

Early in the year (p. 21) attention was called to the decision of the Supreme Court of Ohio regarding the authority of the various editions of the United States Pharmacopœia. The Court decided that as far as Ohio is concerned the edition of 1880 and not that of 1890 is authority, because the Ohio law was passed in 1887 and had reference to the edition then in use only. This decision, if concurred in by the courts of other states, no doubt would create different standards for different states. Such a condition would be exceedingly deplorable—indeed, the prospect of it may well cause men to stop and think, and should do more by far, viz. cause men to act with the least possible delay. However much we may deplore such a decision, or rather the legal state of affairs that necessitates such a decision, it must appear foolish in the extreme for pharmaceutical editors to find fault with the unanimous decision of a state supreme court. Yet this very thing has happened only last month, almost a year after the opinion has rendered. The Wisconsin Dairy and Food Commission acted much more rationally in the matter than this Eastern editor. The legislature was in session at that time and upon notification of the Ohio decision it immediately forestalled a like misfortune in Wisconsin by having the necessary alteration of the law made. The article defining an adulteration now reads in part as follows: "In the case of drugs: First, if, when sold under or by a name recognized in the United States Pharmacopœia, it differs from the standard of strength, or purity laid down in the *latest current edition* thereof."

The Ohio commissioner has recently issued a circular, which, according to the reports of several pharmaceutical journals, is creating consternation in the ranks of "patent medicine" men. The general poison law, demanding the proper labeling of poisonous substances as such, is to be applied to secret nostrums. Now it is generally known that in order to secure pharmaceutical legislation great concessions had to be made to those secret nostrum manufacturers who are in position to wield great influence through the daily press and even in legislative lobbies. On *a priori* grounds it would, therefore, seem rational to suppose that the general poison law was originally not intended to apply to secret nostrums. However, the Ohio commissioner has, no doubt, consulted the state attorney and we hope that he may carry his point, but we should not be surprised if the courts were to decide against his interpretation of the scope of the law. Here again the Wisconsin commission has done the wiser thing and has secured the passage of the following clause:

> "No person by himself, his servant or agent, or as the servant or agent of any other person, shall sell, exchange, deliver, or have in his possession with the intent to sell, or exchange, or expose, or offer for sale or exchange, any medicine known as patent or proprietary, or of which the formula is kept secret by the manufacturer, which contains morphine, strychnine, cocaine, or poisonous or narcotic alkaloid or drug in any quantities which the state board of health shall deem harmful to the life or health of the public, unless the presence of the same be distinctly shown by the label upon the bottle or package and upon the outer wrapper thereof."

It becomes evident that hereafter, if the law is enforced, Wisconsin druggists will have to assume responsibility for the articles they sell and that ignorance or even good intentions will no longer be an excuse before the law after January 1, 1898, when the new law goes into effect. The state board of pharmacy evidently has recognized this fact and through the press has announced its intention to duly warn the druggists of the state by means of a circular.

In viewing the situation from an unprejudiced standpoint at least two things are to be taken into consideration. First, if the state board upon examination pronounces a candidate competent to perform the duties of a pharmacist by granting him a licentiate certificate, such a person is supposed to be responsible for his acts. The very fact that he is compelled by law to place his registration certificate in a conspicuous place emphasizes this fact. The public that is to be protected by such legislative restriction of the practice of pharmacy naturally believes that it is duly protected against fraud and ignorance if it entrusts its life to the hands of a person pronounced competent and responsible by law. That the pharmacist should have been permitted to plead ignorance or good intentions seems to have been out of harmony with the intentions of all pharmaceutical legislation.

On the other hand the secret nostrum evil is one for which the druggist is but in small part responsible. Had the druggist refused from the beginning to have anything to do with this crime on humanity, he would have been spared many afflictions that now beset him. The fact that the druggist kept and sold this class of preparations, though at times reluctantly, no doubt raised this class of medicines in the eyes of the public. Having once made a compact with Mephisto, the druggist now finds it exceedingly difficult to get rid of him. On the other hand the public now demands these remedies, nine-tenths of the demand being created by advertisements in the daily press. That such advertisements are mostly vile corruptions of the truth, does not speak well for the educational influence exerted by the press but does not alter the situation.

That the druggist should be made the principal sufferer for an evil in the creation and maintenance of which he has been at times a willing, at times an unwilling servant of the public, does not seem just. The campaign conducted against the secret nostrum evil must be largely educational in character. The manufacturer who wilfully deceives the public should be exposed and prosecuted. The druggist cannot be expected to examine secret remedies for poisonous substances, because these preparations are sold only in sealed packages. Neither can he know what the board of health may decree "harmful" and what not. The proper course to pursue in this instance is to have the state board of health with the assistance of the state chemist decide what secret remedies should properly be sold in accordance with the provisions of the law and to make known their conclusions to the public and to the druggists in particular. If after such announcement has been made any druggist is found to flagrantly violate the law by selling secret preparations containing harmful ingredients without proper label, then he should be severely punished. *E. K.*

German Association of Naturalists and Physicians.

The 69th annual meeting of this association, corresponding to the "American Association for the Advancement of Science," was held in the old city of Braunschweig, September 19 to 24. The association embraces at present 1040 members; it represents all branches of theoretical and applied natural sciences under the aspects of academical education and study and it divides the deliberation at its annual meetings into 33 and more special sections. Of these, medical sciences stand in the front rank and pharmacy in the last line.

The meetings are conducted in the same way as those of the corresponding associations in the United States and in England. The opening and the concluding sessions are in common and include the customary complimentary greetings and are devoted principally to addresses by some of the most eminent scholars or specialists on topics or problems of the time and of general and paramount interest. According to the number and the extent of these addresses, one or more general sessions besides the opening and concluding ones are arranged. But the principal and more serious work of these meetings is accomplished in the sections, which are devoted entirely to the reading of papers or the demonstration of experimental work and didactic problems. The sections generally hold a morning and an afternoon session, while the evenings are devoted to social or other intellectual recreation and to public entertainments or private receptions.

The public lectures and those of general and commanding interest of the present meeting were those by Professor Richard Meyer of Braunschweig on The relations between theoretical chemistry and research to chemical industry; by Prof. W. Waldeyer of Berlin on Fecundation and inheritance; by Prof. Joh. Orth of Göttingen on Medical education and medical practice; by Prof. Chum of Breslau on Recent deep sea researches, and by Prof. H. W. Vogel of Berlin on The present condition of scientific photography.

The most interesting address to chemists and pharmacists was the initial lecture by Prof. Meyer. The lecture gave a concise review of the metamorphosis of the theory of chemical types to that of the doctrine of the valence of the elements, brought about by the researches and ingenious deductions of Mitscherlich, Kekulé and other chemists, which ultimately gave rise to the fertile chemistry of the benzol derivatives. The practical and economic results of these theoretical doctrines became manifest by the rise of the so-called coal-tar industries, which revolutionized the color and the dying industries of the world and exercised an immense influence and progress in many branches of hygiene and medicine. The endless series of the wonderful coal-tar (aniline) colors, the introduction on a large and cheap scale of carbolic and salicylic acids and the ever-increasing array of synthetic antipyretica and other remedial agents made their victorious and triumphal way to all countries and the chemical industry of Germany rose to an unprecedented magnitude and prosperity.

One of the most remarkable changes in this evolution was that not only the chemical and clinical research laboratories, but not less those of the manufacturing establishments and of the great "color works" shared in this noble race after scientific and practical accomplishments and became important participants in the progress of chemical knowledge and production as applied to sanitary and therapeutical sciences and arts.

The value of coal-tar colors produced in Germany in 1890 amounted to 65 millions of marks and the number of patents granted for this industry by the Imperial Patent Office since its organization in 1877 is said to amount to more than 3000; also the scientific papers presented in argumentation for obtaining patent rights and stored in that office embrace a great amount of most valuable chemical literature.

Later on the discovery and introduction of the serum therapy has introduced an additional factor into the therapeutical application of synthetic remedial agents and the cultivation of this modern branch of organo-chemical and physiological industry has also found the efficient co-operation of "color works." Some of the most prominent ones have added to their chemical research laboratories such for the production of serum and related animal and bacteriological products.

Not less has been the influence of modern chemical research and application upon other important branches of chemical industry, as are the chemistry of the photographic art in all its applications, the sugar industry, the arts of tanning and brewing. As a novel and prospective branch of applied chemistry, electro-chemistry is coming more and more to the front.

In conclusion the lecture sketched the present approved methods for the academic training of chemists. They are in conformity with the demands of the time. The German universities, through the incentives created by their method of teaching chemistry, have brought about the great progress made in the various branches of chemical industry. These institutions will not fail to maintain their unrivalled position for the promotion of true knowledge and for the progress in its application to the best interest and the prosperity of human accomplishments and achievements.

Prof. Waldeyer's address applied more particularly to biological sciences and was summed up with the statement that great progress had been realized in our knowledge of fecundation and inheritance, but that there still remained much to mere conjecture and to further research and elucidation.

Prof. Orth's lecture on medical education and practice was initiated by a retrospect of former and present methods of medical instruction. The former universalist has more and more been supplanted by the specialist in the lecture room, in the clinics and in practice. In consequence of the great strides in most branches of the healing art, the tendency of limiting and of centralizing both the study and the practice of medicine to specialties becomes more and more manifest and necessary, as but few masterminds are able any more approximately to embrace the wide realm of medical knowledge. The profession has fairly well maintained its scope and efficiency, but the methods of education and instruction have recently been forced by the overhelming extent and mass of the collateral sciences upon a retrogressive course.

The great problem of the future practitioner lies less in the cure of human ills, than in their prevention. The future physician will much more have to be a medical adviser in all sanitary and hygienic matters in domestic and public life, so as to secure to the state a healthy and strong generation of men. Home and school hygiene, dietetics and gymnastics are the preventions which the medical practitioner and adviser should cultivate in his peculiar and confidential position in the community. Abstract professional learning shall not supinely shun popular experience and common sense, but shall join hands with approved and rational methods for the amelioration of the physical well being of all men.

The Section of Pharmacy was well attended; about 60 persons entered their names in the list of visitors, which with the exception of the local pharmacists consisted largely of university instructors and a few manufacturers. A detailed account of the programme of this section will be given in the Supplement of the next number.

ORIGINAL CONTRIBUTIONS.

The Caffein Compound in Kola.*

Part II.

KOLATANNIN.

By *James W. T. Knox* and *Albert B. Prescott.*

Products of the Action of Dilute Acids upon Kolatannin.

When kolatannin is boiled with dilute sulfuric or dilute hydrochloric acid, it first passes into solution and on continued boiling a reddish precipitate is formed which becomes gradually darker the longer the heating is kept up. This precipitate is collected by filtration and well washed with water, in which it is insoluble. It is also insoluble in alcohol and only partially soluble in alkali solution. Combustions of this substance, while giving fair duplicates for the same sample, indicate that its composition is not uniform and constant. Samples numbers I and IV were prepared by boiling kolatannin with six percent sulfuric acid, in a flask fitted with a return condenser; number II by heating the tannin and dilute acid in a sealed tube; number III by boiling the tannin and dilute acid in a beaker with occasional addition of water to compensate for evaporation; number V by boiling caffein tannate with dilute acid in a flask fitted with return condenser; number VI is the result of combustion of a similar substance made and reported last year.[28]

	I. Av. of 2.	II. Av. of 2.	III. Av. of 2.	IV. Av. of 2.	V. Av. of 2.	VI. Av. of 2
C.	53.60	50.45	51.27	56.38	54.49	69.20
H.	5.34	4.85	5.24	5.69	5.87	6.70
O.	41.06	44.70	43.49	37.93	39.64	24.10

The aqueous filtrate was shaken out with ether, the residue after evaporation of the ethereal solution was re-dissolved in water and boiled a short time, which caused precipitation of the coloring matter. Then, filtering, it was again extracted with ether and the operation repeated several times. At length the ethereal solution left a nearly colorless residue on evaporation, which responded to the tests for protocatechuic acid. Oak bark tannin also when subjected to similar treatment with dilute mineral acids yields protocatechuic acid.

Etti, Böttinger and Löwe each mention the insoluble red body formed from oak tannin on boiling it with dilute acids, and consider it an anhydrid. They do not agree on which of the anhydrids it is, however. In fact as already mentioned there were many points in their work on tannins on which they were at variance. Etti[29] found gallic acid in the acid filtrate. Löwe[30] does not mention having examined the liquid for bodies other than sugar. Trimble,[31] however, whose work is the most recent, found protocatechuic acid as a by-product, in every case. He does not commit himself on the question of whether the dark brown, amorphous, insoluble substance separated from tannin by the action of hot dilute acids is an anhydrid.

Whatever may be the relation of the body separated in this way from oak bark tannin to the original tannin, there does not as yet seem to us to be any good reason for considering the corresponding substance precipitated from acid solutions of kolatannin, an anhydrid of kolatannin. The evidence thus far is against it. Boiling with dilute mineral acids is in general a means of hydrolysis, rather than of anhydrolysis; we would therefore expect saponification instead of anhydrid-formation: as a matter of fact an aromatic acid—protocatechuic—has been found in the acid filtrate after collecting the insoluble red substance in question, while if the reaction were one of simple anhydrid formation, no by-products should be present. If the red-brown substance were an anhydrid of kolatannin, we would expect it to have a higher percentage of carbon than the original tannin, but in most cases combustion indicates a lower percentage of carbon. We would also expect to find the body of uniform composition when prepared by similar means, but the analyses just mentioned show that it is very variable in content of carbon and hydrogen, while its appearance also varies from red to dark brown. At present no more can be said of this body than we have already said, viz. that it is red or dark brown, amorphous, insoluble in water, in alcohol, in ether and in chloroform, only partially soluble in dilute alkali, and that it is a decomposition product obtained by boiling kolatannin, or caffein kolatannate, with dilute mineral acids.

Knebel's[32] "kolaroth" is a body obtained in the same way, except that he prepared it from caffein kolatannate, or as he supposed "kolanin," which was the alleged "caffein-bearing glucosid" of kola. Inasmuch as the free tannin of kola, and that combined with caffein, are identical, as will appear further on in these pages, it makes no difference which kind of it is used for this purpose. Knebel, however, worked with caffein tannate from the dried drug, while our work has been entirely on that from the fresh drug. He fails to give the figures of his combustions, but Hilger[33] reports the following stated results:

	Found. I.	 II.	Calculated for $C_{14}H_{13}(OH)_5$.
Carbon..............	63.09	62.65	63.16
Hydrogen..........	6.85	6.50	6.75
Oxygen.............	30.06	30.85	30.09

This calculated formula does not differ widely in carbon content from that calculated for the fourth anhydrid of kolatannin, $C_{16}H_{16}O_6$.

	Calculated for $C_{16}H_{16}O_6$.
Carbon........................	63.37
Hydrogen....................	4.95
Oxygen........................	31.68

The hydrogen is rather high, however, which makes the oxygen correspondingly low. The results of an analysis of a body like the one Hilger analysed might have been construed to indicate it as a member of the anhydrid series, and inasmuch as he found a substance yielding analytical figures nearly coinciding with those just given for the fourth anhydrid, it is perfectly reasonable to suppose that if we had made combustions of a larger number of samples, we might have obtained some results which could be used in support of the idea that these decomposition products of tannins are simple anhydrids of them. Our experience has taught us that the composition of this product is by no means constant with the means used in its preparation, and we saw no good reason for selecting the figures of one combustion from those of a dozen others presumably as near correct, merely to give support to a theory.

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* Continued from p. 195.

[28] Knox and Prescott, 1896: Proc. Am. Pharm. Assoc. 44, p. 136.

[29] C. Etti, 1884: Berichte 17, p. 1820.

[30] J. Löwe, 1881: Zeitschrift f. Anal. Chem. 20, p. 208.

[31] H. Trimble: "The Tannins" II, p. 92.

[32] E. Knebel, 1892: Apoth. Zeitung 7, p. 112.

[33] A. Hilger, 1893: Vierteljahr. f. öffentl. Gesundpflg. 25, p. 559.

It is somewhat puzzling that Knebel and Hilger have found this body of uniform composition. As a matter of fact Knebel reports no figures in support of his claim and Hilger reports only two combustions, still it would be supposed that before assigning a formula to a body of this kind a larger number of combustions would have been made, and with different samples. We do not feel justified in accepting the formula $C_{14}H_{13}(OH)_5$ proposed by them for it, nor do we at present possess sufficient data for a formula. We do not even know that it is not a mixture of two or more substances; and although we have not made any separation of them, it seems to us more probable than otherwise that it is a mixture in varying proportions of certain products of decomposition of kolatannin.

The suggestion of Knebel that the tannin of kola is an oxidation product of "kolaroth" according to the equation

$$\underset{\text{Kola red}}{C_{14}H_{13}(OH)_5} + 4O_2 = \underset{\text{Gallotannic acid}}{C_{14}H_{10}O_9} + 4H_2O$$

is untenable for the twofold reason that we do not find kolatannin or this decomposition product of it to be so readily oxidizable as stated by him and furthermore that kolatannin is not identical with gallotannic acid, the formula of which he has given in the above equation as the formula of kolatannin, nor have we at any time found any gallotannic acid present in kola.

Knebel claims to have prepared a pure product of his kolaroth from the acetyl compound of it; and he further claims that the exact separation of kolaroth may be had by boiling his so-called "kolanin" (caffein kolatannate) with acetyl chlorid, whereby an acetyl compound of "kola red" is formed, and is separated by pouring the mixture of acetyl chlorid and caffein kolatannate into water. The acetyl compound of kola red is thus precipitated and the glucose and caffein pass into solution.

Let us examine this statement in the light of the recent knowledge of the chemistry of this interesting drug. First, as conclusively proven by us last year, the body called "kolanin" is not a glucosid composed of caffein, glucose and "kola red," but is a combination of caffein with the tannin of kola, $C_{16}H_{15}O_3(OH)_5$, and with anhydrids of that tannin, in varying proportions, depending largely on the method used to separate it from the drug. And it contains no glucose whatever, for we have since learned that the evidence of sugar found in it and in free kolatannin last year and reported in our paper was due to the accidental presence of glucose from a faulty method of separation. Moreover, acetyl chlorid does not effect an exact separation of the caffein from this combination. We prepared an acetyl derivative of caffein kolatannate exactly as was done with the other acetyl products and analysed it, with the following results:

Carbon	58.30
Hydrogen	4.85
Nitrogen	2.54
Oxygen	34.31

The nitrogen content corresponds to 8.79 percent of caffein. The caffein kolatannate from which this acetyl compound was made contained 6.53 percent nitrogen, corresponding to 22.6 percent caffein. Caffein was also found in the liquid from which the acetyl compound was filtered. The separation then is not complete and the acetyl compound is not a pure acetyl compound of caffein kolatannate, nor was it expected to be; for as caffein kolatannate contains kolatannin and some of its anhydrids, both capable of forming acetyl compounds, it naturally follows that any acetyl derivative prepared will not be a simple derivative of one of the bodies, as stated by Knebel, but will be a mixture of acetyl derivatives of the tannin and its anhydrids, probably in the proportions in which they existed prior to the operation. With this understanding of it it is difficult to see how Knebel could have prepared the pure and simple acetyl compound in the way stated by him.

The Question of Sugar Production.

Results were obtained in our work last year which seemed to indicate that kolatannin was a glucosidal body. We wished to investigate this question more fully and have done so in the following described way:

Kolatannin was dissolved in water and precipitated by lead acetate, the collected lead salt was washed with water for several hours; the lead salt was then decomposed by dilute sulfuric acid, the lead sulfate filtered out, and the acid filtrate boiled for four hours in a flask fitted with a return condenser. The acid strength was supposed to be about 5—6 percent. The insoluble matter was filtered out, the acid removed by addition of barium carbonate and the liquid again filtered; the coloring matter was precipitated by lead acetate and the precipitate removed by filtration, after which the remaining lead acetate was removed by hydrogen sulfid. The filtrate was boiled to remove all the hydrogen sulfid and made alkaline with a little sodium hydroxid solution. The liquid was still slightly colored. It was tested with Fehling's solution and gave a red precipitate. A portion of it made slightly acid with acetic acid gave negative results when the osazone test was applied, and a control test made at the same time, using a little solution of grape sugar in addition, gave the well known yellow precipitate. This showed that there was no interference with the phenylhydrazin test. Basic lead acetate solution was added, which precipitated the traces of coloring matter in the solution, and after removing the excess of lead, the solution was tested with Fehling's solution again, with negative results this time.

This experiment was repeated in a slightly different way, as follows: The well-washed lead salt of about one gramme kolatannin was heated for two hours at 110° C. in a sealed tube with 30 cc. hydrochloric acid, the tube then opened and the contents filtered to remove lead chlorid and the amorphous red decomposition product of kolatannin. The filtrate was red colored and was shaken out several times with ether. The ethereal solutions were set aside for further examination. The filtrate was then boiled to remove the traces of ether and exactly neutralized with sodium hydroxid, after which basic lead acetate solution was added until no further precipitation occurred, the precipitate removed by filtration and the excess of lead salt precipitated as lead sulfate by cautious addition of dilute sulfuric acid. The solution was again filtered, made slightly alkaline with sodium hydroxid solution and tested with Fehling's solution with negative results.

The importance of using basic lead acetate to precipitate the coloring matter is shown by the fact that if only normal acetate be used, a small amount of coloring matter is left in solution and gives a precipitate with Fehling's solution, while if basic lead acetate be employed, all the coloring matter is removed and the copper solution is not affected.

In the ethereal solution, protocatechuic acid in small quantity was found, as stated in another part of this paper.

The experiments described having given negative results, the interpretation is made that kolatannin is not a glucosid, and that the evidence we had to the contrary last year was caused by the incomplete removal of the glucose of the plant, due to a faulty method of separation for the tannin, since discarded by us.

It is significant that this result places kolatannin in a category and gives it a character essentially different from the character of caffetannic acid, as understood by the chemical world from the report of Hlasiwetz.

Action of Fused Alkali.

Fifteen grammes kolatannin were fused for two hours with potassium hydroxid, the fused mass cooled and acidulated with sulfuric acid, after dissolving it in water. Without filtering the mixture, it was shaken out with ether, the successive portions of this solvent united and evaporated. The residue was distinctly crystalline, the crystals assuming an arborescent form for the most part. This residue was purified several times by recrystallization, after which it was dissolved in water and submitted to tests. Protocatechuic acid and phloroglucin were found to be present.

Action of Heated Glycerin.

One gramme kolatannin was heated with three cc. glycerin in a porcelain capsule for twenty minutes at 195°—200°. Fifty cc. water were then added and the mixture was shaken out with ether. The residue left on evaporating the ethereal extract was found to contain protocatechuic acid, by chemical tests.

KOLATANNIN FROM CAFFEIN KOLATANNATE.

It has thus far not been found practicable to substitute other means of separation of this tannin from its caffein salt, for the treatment by lead hydroxid, although the disadvantages of this agent are fully appreciated. It is, however, much preferable to lead acetate in this particular case, as lead acetate precipitates some caffein tannate along with the lead tannate, and the resulting tannin is apt to be contaminated accordingly.

Preparation of the Sample.

The caffein tannate is dried on porous plates and finely powdered and sifted; it is then washed with a mixture of ether and chloroform to remove any traces of adhering fat, and dried again. It is then washed with ice-cold water by agitation, drained and washed again until the washings give no precipitate of silver chlorid on being treated with solution of silver nitrate acidulated with nitric acid. The caffein kolatannate is now dissolved in dilute alcohol, making a very concentrated solution; this solution is filtered and poured into ten or twelve times its volume of ice-cold water, whereupon the caffein compound is re-precipitated. It is collected by filtration, drained well and redissolved in dilute alcohol, using gentle heat on the water bath. Freshly precipitated lead hydroxid triturated to a smooth paste with warm alcohol is now added in excess and the mixture warmed on the water bath for a few minutes, with stirring. The precipitate is now allowed to subside and if sufficient lead hydroxid has been added the supernatant liquid will be colorless or faintly straw colored, while the precipitate of lead kolatannate mixed with lead hydroxid forms a compact magma at the bottom of the container. The liquid, which contains kola alkaloids, is poured off and the precipitate is washed repeatedly with dilute alcohol, first by decantation and then by filtration, until several cc. of the filtrate evaporated in a porcelain dish leave no perceptible residue and give no test for caffein. The precipitate is compact and is much more readily washed than that given by lead acetate. It is then suspended in dilute alcohol and treated with hydrogen sulfid until the tannin is all liberated. The lead sulfid is then filtered out and washed with dilute alcohol until the washings are colorless. The filtrate is concentrated by distillation in vacuo to small volume, and eight or ten volumes of water are added. This precipitates a reddish mass, a mixture of certain anhydrids of kolatannin, which is filtered out and set aside. The filtrate containing tannin together with dissolved anhydrids is now shaken with ether once or twice, and the washings thrown away. Then ethyl acetate is added and the tannin separated and purified in the way already described, under the method of preparation of kolatannin.

This "combined" kolatannin, although not quite as light colored as the "free" tannin, shares all its reactions and solubilities.

Combustion of "Combined" Kolatannin.

It was analysed by combustion and the following results obtained, which coincide very closely with those resulting from combustion of the "free" tannin:

	Found. I.	II.	III.	Calculated for $C_{16}H_{20}O_8$.
Carbon	56.53	56.78	56.42	56.45
Hydrogen	5.68	5.79	5.74	5.90
Oxygen	37.79	37.43	37.84	37.65

The Pentacetyl Compound.

This was prepared in the same manner as the other acetyl derivatives and is identical with the pentacetyl compound of "free" kolatannin, heretofore described.

The analytical results are as follows:

By combustion.	Found. I.	II.	III.	Calculated for $C_{16}H_{15}(C_2H_3O)_5O_8$.
Carbon	56.75	56.44	56.61	56.72
Hydrogen	5.54	5.41	5.31	5.47
Oxygen	37.71	38.15	38.08	37.81
By saponification.				
Acetyl	38.27	38.53	38.68	39.09

The Bromin Compounds.

These were prepared in identically the same way as the corresponding ones of the free tannin. In appearance and properties there seems to be no difference between these and those of free kolatannin, and for the sake of brevity we shall omit further description and confine ourselves merely to the statement of analytical results, in each case.

Tribrom Derivative.

	Found.			Calculated for
By combustion.	I.	II.	III.	$C_{16}H_{17}Br_3O_8$.
Carbon	33.09	33.25	......	33.28
Hydrogen	2.84	2.98	......	2.95
Oxygen	22.50	22.13	......	22.19
As silver salt.				
Bromin	41.57	41.64	41.74	41.58

Pentacetyl Tribrom Derivative.

(Formed by acetylising the tribrom derivative.)

	Found.			Calculated for
By combustion.	I.	II.	III.	$C_{16}H_{12}Br_3(C_2H_3O)_5O_8$.
Carbon	39.64	39.82	......	39.65
Hydrogen	3.47	3.61	......	3.44
Oxygen	26.44	25.94	......	26.43
As silver salt.				
Bromin	30.45	30.63	30.71	30.43
By saponification.				
Acetyl	26.66	26.97		27.32

Tribrom Pentacetyl Derivative.

(Formed by brominating the pentacetyl derivative.)

	Found.			Calculated for
By combustion.	I.	II.	III.	$C_{16}H_{12}Br_3$-$(C_2H_3O)_5O_8$.
Carbon	39.88	40.15	......	39.65
Hydrogen	3.26	3.45	......	3.44
Oxygen	26.34	25.74	......	26.43
As silver salt.				
Bromin	30.52	30.66	30.57	30.48
By saponification.				
Acetyl	26.78	27.04	......	27.32

Tetrabromin Derivative.

	Found.		Calculated for
By combustion.	I.	II.	$C_{16}H_{16}Br_4O_8$.
Carbon	29.13	29.35	29.27
Hydrogen	2.29	2.46	2.44
Oxygen	19.86	19.30	19.52
As silver salt.			
Bromin	48.72	48.89	48.77

Pentacetyl Tetrabrom Derivative.

	Found.		Calculated for
By combustion.	I.	II.	$C_{16}H_{11}Br_4(C_2H_3O)_5O_8$.
Carbon	36.12	36.33	36.03
Hydrogen	2.78	2.96	3.01
Oxygen	24.33	23.78	24.02
As silver salt.			
Bromin	36.77	36.93	36.94
By saponification.			
Acetyl	24.64	24.78	24.83

Pentabrom Pentacetyl Derivative.

(Formed by brominating the pentacetyl derivative.)

	Found.		Calculated for
By combustion.	I.	II.	$C_{16}H_{10}Br_5(C_2H_3O)_5O_8$.
Carbon	33.23	32.98	33.02
Hydrogen	2.62	2.72	2.65
Oxygen	21.71	21.78	22.01
As silver salt.			
Bromin	42.44	42.52	42.32
By saponification.			
Acetyl	22.49	22.26	22.75

Hexabrom Derivative.

	Found.		Calculated for
By combustion.	I.	II.	$C_{16}H_{14}Br_6O_8$.
Carbon	23.85	23.68	23.59
Hydrogen	1.77	1.83	1.72
Oxygen	14.76	14.72	15.73
As silver salt.			
Bromin	59.62	59.77	58.96

Tetracetyl Hexabrom Derivative.

	Found.		Calculated for
By combustion.	I.	II.	$C_{16}H_{10}Br_6(C_2H_3O)_4O_8$.
Carbon	29.66	29.92	29.33
Hydrogen	2.46	2.29	2.25
Oxygen	18.73	18.55	19.55
As silver salt.			
Bromin	49.15	49.24	48.87
By saponification.			
Acetyl	16.48	16.73	17.52

Kolatannin Anhydrids obtained from Caffein Kolatannate.

The insoluble, reddish-brown precipitate formed on addition of cold water to the tannin solution after the separation of the tannin from its lead salt, as mentioned in the method of preparation of "combined" kolatannin, was well washed and dried at 100°. Combustion of this showed a carbon percentage intermediate between that of the second and third anhydrids of kolatannin.

As the solubilities of the anhydrids appear to be about the same, we were unable to effect a separation of them, and for this reason we heated the (supposed) mixture at 135°—140° to constant weight, in order to convert it all if possible into the third anhydrid. It was then subjected to another combustion with the following results:

	Found.		Calculated for
	I.	II.	$(C_{16}H_{17}O_6)_2O$.
Carbon	61.27	61.46	61.54
Hydrogen	5.28	5.43	5.13
Oxygen	33.45	33.11	33.33

These results agree very well with the calculated formula and with those obtained by combustion of the third anhydrid of so-called "free" tannin of kola.

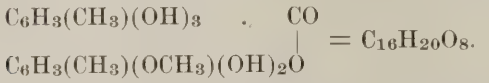
The identity of the tannin of caffein tannate with the free tannin having been positively settled by the analyses already given and by one or two evidences yet to be stated, it was deemed unnecessary to make a further comparative study of its bromin derivatives.

Action of Dilute Acids.

The experiments described as having been performed on "free" kolatannin were repeated on this kind of kolatannin also with parallel results. The same is to be said of the products of fusion with potassium hydroxid and of heating with glycerin.

Further Indications of Molecular Constitution.

Whether there be a carboxyl in kolatannin or not, remains open to question and to further determinations. Its moderate acid character is not inconsistent with the negative polarity of a polyhydric phenol reinforced by the oxygen of an anhydrid group, yet destitute of entire carboxyl. Our numerous analyses of kolatannin and its several derivatives as described in this paper are in close agreement with a polyhydric phenol anhydrid, carrying two methyl groups and one methoxy group, but standing altogether as a di-addition benzene derivative, two such benzene nuclei pairing together in an ester-like anhydrid. On this supposition, a monomethyl di-hydrogen trihydroxy benzoic acid has paired ester-wise with a monomethyl methoxy di-hydrogen trivalent phenol. The di-additive benzene constitution is not improbable among plant constituents of this class, finding parallel in the additive structure of the terpenes. If we admit the hypothesis of the molecular formula above indicated, we must predicate that one of the six hydrogen atoms joined to benzene-carbon is in position somewhat unfavorable to its bromine substitution, and when brominated quite preventing the acetylization of one of the hydroxyls. Finally, it remains entirely without proof as to the distribution of the hydroxyl and methoxyl groups between the two benzene nuclei.



$$\begin{array}{ll} C_6H_3(CH_3)(OH)_3 & CO \\ & \quad| \quad = C_{16}H_{20}O_8. \\ C_6H_3(CH_3)(OCH_3)(OH)_2 & O \end{array}$$

As to Chemical Bearings upon Pharmacology.

Finally it must be admitted that the stable caffein compound of an acid of such marked chemical individuality as that of kolatannin can by no means be assumed to have the same physiological effects as free caffein. And this subject is one of pharmacological importance for the caffein of all the beverage plants.

We are under many obligations to Mr. James Heggie, B. S., for his very efficient assistance in preparing and analysing the various derivatives of tannin reported in the preceding pages.

Discussion of Recent Assay Methods.

Within the past year two processes for the assay of kola have been offered, which seem to us not to be free from objections. We give below the essential points of these methods without entering into unimportant details.

Method of Jean.[34]

This author ascribes his plan of procedure in part to MM. Chodat and Chuit. He boils the dried and powdered drug with "milk of lime," dries the whole in an oven and powders it again. This powder is exhausted with chloroform, which removes the free alkaloids. The chloroform is evaporated to dryness, the residue dissolved in hot water and filtered. The filtrate is evaporated to dryness and weighed as caffein.

For "Kolanin": the drug after treatment with chloroform is extracted with alcohol, the alcohol evaporated from the percolate and the soft extract remaining is dissolved in boiling water, which solution after cooling is filtered. The insoluble matter remaining on the filter is dried in an oven and weighed as "kolanin".

The most serious defects in the above described method are (1) the boiling with "milk of lime," (2) the prolonged heating necessary to dry the drug after that treatment, (3) weighing the caffein instead of estimating it with Wagner's reagent volumetrically, (4) the means employed to separate so-called "kolanin," (5) estimating caffein kolatannate ("kolanin") by weight as such instead of by its caffein content.

(1) Boiling with "milk of lime" or other aqueous alkalies tends to decompose caffein—a fact too well known to require further comment. This treatment also tends to liberate caffein from its tannate and thus prevents an exact determination of the proportion of "free" to "combined" alkaloids that originally existed in the drug. The starch of kola, amounting to nearly forty percent,[35] causes the drug to become of a jelly-like consistence when boiled with aqueous liquids, and when dried the mass is very hard to powder and even when powdered the condition of it is well calculated to resist the penetrating action of the solvent, and thus cause incomplete extraction.

(2) The gelatinous condition of the drug after boiling with "lime water" renders it hard to dry completely, and as very prolonged heating is necessary, there is danger of loss of caffein by sublimation.

(3) We do not consider that the alkaloids of kola are sufficiently pure when removed in this, the usual manner, to be weighed as such. Gomberg's[36] volumetric method gives more accurate results.

(4) If any caffein kolatannate escapes decomposition during the first part of the assay, which will occasionally happen, it is removed by the extraction with alcohol. But as it is somewhat soluble in water and more soluble in aqueous solutions containing tannin, the directions to collect and weigh the portion left undissolved by water will generally be found superfluous, for the small amount of it present will generally pass into and remain in solution. Dieterich[37] had this experience and met with nothing but disappointment in trying to estimate caffein kolatannate by this method.

(5) Caffein kolatannate has been shown to be a body of somewhat variable composition, with a caffein content ranging from 19 to 25 percent. Inasmuch as the value of kola as a stimulant depends primarily on its percentage of caffein, and as the weight of its caffein compound indicates only approximately the amount of its combined caffein, there would not seem to be any reason for attaching much importance to the weight of this compound, if a very precise valuation of the drug is desired. We hold that a direct estimation of the caffein of this compound is preferable, and at least as expeditious.

Method of Carles.[38]

Ten grammes kola, one gramme calcium hydroxid and twenty grammes 80 percent alcohol are mixed together and dried on the water bath until the weight is reduced to fourteen grammes. The mixture is then powdered and transferred to a 100 cc. flask containing 35 cc. of a mixture of 100 parts chloroform and 20 parts alcohol, and heated one hour on a water bath. After filtration the residue is extracted next with 20 cc. of the same solvent and finally with 10 cc. The united extracts are evaporated to dryness and the residue taken up with 10 cc. boiling water containing four or five drops of one percent sulfuric acid, then with 6 cc. and finally with 5 cc. The solutions are united, filtered, evaporated to constant weight and weighed as caffein.

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[34] J. Jean, 1896: Repert. de Pharm. (3), 7, p. 49.

[35] Knox and Schlotterbeck, 1895: Proc. Am. Pharm. Assoc., p. 334.

[36] M. Gomberg, 1896: J. Am. Chem. Soc. 18, p. 331.

[37] Dieterich, 1896: Ch. Centralbl. II, p. 675.

[38] P. Carles, 1896: Jour. de Pharm. et de Chim. 16, p. 104.

For "kolanin," which the author recognizes as caffein kolatannate, another sample of the drug is taken and extracted with water to remove the caffein and other soluble constituents. The drug is next extracted with 70 percent alcohol, the extract evaporated to dryness, transferred to a filter, washed with cold water, then dried at gentle heat and weighed. If it be desired to estimate the alkaloids of this compound, one gramme "kolanin," one gramme calcium hydroxid and three grammes chalk with a little 70 percent alcohol are mixed together and evaporated on the water bath to about six grammes, and extracted with alcoholic chloroform in the manner already described.

The objections to this method are in part among those already mentioned in the discussion of Jean's method. The use of lime or other alkalies in the assay of a caffein-bearing drug is to be deprecated. The solvent used is not a proper one for the reason that sufficient alcohol is present to extract other constituents in addition to the alkaloids, which are not removed from the caffein during the subsequent treatment of the residue and which when weighed with the caffein lead to erroneous results. Moreover, the manner of applying the menstruum is inconvenient, does not insure complete extraction and is in no way preferable to the ordinary extraction by the use of Soxhlet's apparatus. The addition of the sulfuric acid is unnecessary and does not add to the purity of the final product, which is dark colored and very plainly impure. The objection to weighing a final residue as caffein finds especial application in this method.

As the properties of caffein kolatannate had not been made known very generally at the time of the publication of these methods, there is some excuse for the assumption of both these writers that it is wholly insoluble. Carles has proceeded on this hypothesis in directing the drug to be extracted with cold water to remove the water-soluble constituents before exhausting it with alcohol to remove the caffein compound, but inasmuch as caffein kolatannate is not only somewhat soluble in water, but considerably more soluble in solutions of caffein and of tannin, the extraction of kola by water will remove a considerable amount of it. The same is to be said of the final washing of the caffein compound with water, which is quite inadmissable in quantitative work. Carles seems to have recognized the uncertain value of gravimetric determinations of caffein kolatannate, and is to be commended for offering an alternate method providing for its valuation according to the amount of its alkaloids.

At our request Mr. James W. Cobb, Ph. C., has assayed a sample of dried kola by each of the foregoing methods and by the method adopted by us last year[39] after thoroughly familiarising himself with them by preliminary work.

	Method of Jean.		Method of Carles.		Knox and Prescott.	
	I.	II.	I.	II.	I.	II.
Caffein by weight	1.93	1.79	2.16	2.33	......	......
The same titrated	1.83	1.71	1.87	1.98	1.96	1.88
"Kolanin"	none	none	2.89	3.17	......	......
Combined alkaloids	......	......	......	......	1.62	1.61
Alkaloids of "kolanin"	......	......	.59	.69	......	......
Total alkaloids	1.83	1.71	2.46	2.67	3.58	3.49

It will be seen that the impurity of caffein separated by Jean's method amounts to 4.84 percent and that of the caffein by Carles' method amounts to 14.25 percent, which was determined by titrating the caffein with Wagner's reagent, after Gomberg's method.

Both methods give very low results as compared with those obtained by our own. They are tedious and otherwise unsatisfactory, in addition.

Further notes on the assay of kola are in course of preparation.

All the work reported upon in this paper has been done under the provision of the Stearns Fellowship of the University of Michigan.

Ann Arbor, Michigan, July 3, 1897.

Alkyl Bismuth Iodides.

By *Albert B. Prescott.*

The common alkyl ammonium iodides, with solutions of the bismuth salts, give bright colored precipitates. As formed by quaternary methyl or ethyl ammonium iodide the color is orange-yellow in most cases, lighter in color when obtained with bismuth chloride, darker when obtained with bismuth nitrate. When fully formed by excess of the organic iodide, in bismuth solution not strongly acid, the precipitation is amorphous and so nearly complete that when the filtrate from a test-tube portion is evaporated to dryness and the residue ignited and treated with solvent acid, hydrogen sulphide fails to blacken the liquid. Strong mineral acids slowly decompose these colored precipitates, liberating iodine.

What has been known as Dragendorff's reagent for alkaloids is a potassium bismuth iodide, prepared by dissolving precipitated bismuth iodide in a concentrated solution of potassium iodide acidulated with hydrochloric acid, and known as giving reddish colored precipitates in solutions of the salts of the alkaloids. On trial with pyridine salts, a corresponding precipitate was obtained, dark orange-red and voluminous. Kraut[1] has reported the piperidine compound, to which all these are analogous.

These organic bismuth iodides are not perfectly proof against decomposition by much water; they are sparingly soluble in ethyl or amyl alcohol, insoluble in glacial acetic acid, in ethyl ether, in chloroform, and in benzene.

The tetramethyl ammonium bismuth iodide crystallizes from hydrochloric acid, that of sp. gr. 1.19 diluted with an equal measure of water. Also from potassium iodide solution acidulated with hydrochloric acid. The pyridine and the alkaloid bismuth iodides crystallize from alcohol. In all the cases the crystals are clearly hexagonal and easily obtained.

Both the amorphous and crystalline forms are stable in the air. A sample of tetramethyl ammonium bismuth iodide remained constant in weight at 130°; atropine bismuth iodide melts, but at 98° C. holds constant weight.

Reducing agents, as potassium thiosulphate, do not alter these bismuth iodides. Tetramethyl ammonium bismuth iodide, precipitated from ten percent solutions, both of the organic iodide and bismuth iodide, washed with hydrochloric acidulated water, then with pure water till washings gave no residue, then with alcohol and lastly with ether, and dried at 110°, gave figures as follows.

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[39] Knox and Prescott, 1896: Proc. A. Ph. A. 44, p. 136.

[1] Ann. Chem. (Liebig) 210, pp. 310—327.

Analyses I and II were of the same preparation, III and IV from other preparations made at different times.

	I.	II.	III.	IV.	$N_3(CH_3)_{11}HBi_2I_7$.
Iodine.........	58.71	58.29	60.79		59.22
Bismuth.....	27.08				27.07
Carbon.......	8.69	8.68	8.58	8.06	8.82
Hydrogen...	2.16	2.12	2.30	2.37	2.08
Nitrogen.....	2.81	2.73			2.81

The pyridine bismuth iodide, prepared from a pyridine salt by Dragendorff's reagent and crystallized from alcohol, on elementary analysis gave figures as follows:

Different preparations:	I.	II.	III.	$(C_5H_5N)_3HI)_3Bi_2I_6$.
Iodine..............	63.98	62.84	62.24	63.59
Bismuth...........	23.36	23.72		23.18

Kraut (Ann. 210, pp. 310—327) found analogous composition for piperidine bismuth iodide.

The corresponding atropine bismuth iodide gave results as follows:

Several preparations:	I.	II.	III.	$(C_{17}H_{23}NO_3)_3(HI)_3Bi_2I_6$.
Iodine................	46.99	47.03	46.51	46.96
Bismuth.............	18.82	18.67	18.53	17.22
Carbon...............	23.22	23.62	23.69	25.23
Hydrogen..........	2.87	3.02	2.94	2.96

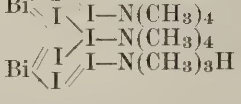
The carbon is too low for the theory, so that the figures approach to those of $(C_{17}H_{23}NO_3)HI)BiI_3$.

The brucine compound gave, for $(C_{23}H_{26}N_2O_4)_3(HI)_3Bi_2I_6$, of iodine 41.10 and 40.88 percent against 41.56 by calculation from the formula.

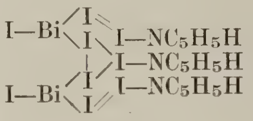
The corresponding strychnine salt gave, of iodine, 44.02 and 44.65 percent against 44.48 by calculation from the formula.

In the results of the work upon the perhalides and double halides of nitrogen bases, undertaken in the last two or three years, everything goes to support the theory that two or more halogen atoms link to each other with an (uneven) valence of more than one, so as to connect one group of atoms with another. Iodine especially among the halogens serves as a binding element in the coupling of molecules, or groups, with each other, as well as in massing many iodine atoms together in a heavy periodide, as a swarm of bees hangs upon the bough of a tree. In the double iodide structure, where iodine links one base to another base, serving between positive and positive, with iodine not in excess of the "normal" number of its atoms, potassium thiosulphate will not take iodine out of the compound. In the periodide structure, where iodine links a base to additive iodine, serving between a positive and a negative group, potassium thiosulphate promptly removes all the additive iodine, leaving a normal single iodide. These generalizations apply to the dipyridine alkyl iodides reported, with determination of molecular weight, by Mr. Flintermann and myself in 1895.[2] Also to the various monopyridine alkyl normal iodides[3] and to the numerous periodides.[4] In the compounds of additive iodine, as in double iodides, the results of analysis are in most cases consistent with an uneven valence of iodine, indeed with its trivalence. But there are a very few periodides well determined by Mr. Trowbridge as monopyridine compounds, in which, in our present knowledge, an even numerical valence of iodine is indicated.[5]

The bismuth iodides of nitrogen bases reported in this paper, both those of fatty alkyls on the one hand and those on the other hand of pyridine and pyridine-derived alkaloids, all evidently conform in their analytical content to the regular iodine-linking structure, the structure common both to double iodides and periodides as shown in the following proposed constitutional formulæ. In the case of the quaternary ammonium bismuth compounds, with the prevailing bismuth characteristic of losing halogen in presence of water, the wash-water being found tinged with iodine, each bismuth atom is directly bound to only two atoms of iodine, while in the pyridine-formed compounds the bismuth atom is bound to three atoms of iodine in each instance, bismuth and iodine valences being always the same. Again, the fatty ammonium compounds, less stable as they are, show a variation from the quaternary to the tertiary base type, in one of the three nitrogen base groups of the molecule. This doubtless comes about by reaction of water to form methyl alcohol as by-product, leaving hydrogen in place of methyl in the main-product.



$=N_3(CH_3)_{11}HBi_2I_7$
Tetramethyl ammon-bismuth iodide.



$=(C_5H_5N)_3(HI)_3Bi_2I_6$
Pyridine ammon-bismuth iodide.

Analogous to
$(C_{17}H_{23}NO_3)_3(HI)_3Bi_2I_6$.
Atropine bismuth iodide.

It appears, therefore, that **the bismuth iodides of organic nitrogen bases** constitute a distinct class of compounds, with marked physical properties and a constitution of much chemical interest. As a combination it is the more noteworthy, because bismuth and nitrogen are the members most remote from each other in the same family of elements.

The alkaloidal bismuth iodides are not quantitatively uniform enough to be entirely satisfactory for alkaloidal assay, but are more stable and uniform than the alkaloid mercuric iodides formed by Mayer's reagent. On the other hand, they are more bulky, less easy to gather into compact mass, less managable in filtration. On the whole, so far as found, Dragendorff's reagent gives no general advantage over that of Mayer, though I am well aware how unsatisfactory the latter has been found in the hands of analysts.

For the execution of the work upon tetramethyl ammonium bismuth iodide, I am wholly indebted to Mr. H. E. Brown; for that upon the bismuth iodides of pyridine and the alkaloids, to Mr. O. C. Diehl. A further study of the reactions of the halides of bismuth and related metals upon representative organic bases is now left to Mr. Brown.

Ann Arbor, Mich., August, 1897.

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[2] J. Am. Chem. Soc. 18, p. 28.

[3] Prescott and Baer, 1896: J. Am. Chem. Soc. 18, p. 247.

[4] Prescott and Trowbridge, 1895: J. Am. Chem. Soc. 17, p. 859; P. F. Trowbridge, 1897: J. Am. Chem. Soc. 19, p. 322; Trowbridge and Diehl, 1897: J. Am. Chem. Soc. 19.

[5] Trowbridge, 1897: J. Am. Chem. Soc. 19, p. 330.

Popular Scandinavian Names of Drugs and Medicines.[*]

By *Harold Bruun.*

Eddikesurt Kali,	Potassium acetate.
“ Kobber,	Copper acetate.
“ Magnesia,	Magnesium acetate.
“ Morphin,	Morphine acetate.
“ Natron,	Sodium acetate.
“ Zink,	Zinc acetate.
Eddike spanskflue,	Vinegar of cantharides.
“ strandlög,	“ of squills.
Egebark,	White oak bark.
Egenödder,	Acorn.
Egenödkaffe,	Acorn coffee.
Elmetrae,	Elm.
Elixir antiasthmaticum Aaskovi,	*Tinct. digitalis rubra.*
Enebaer,	Juniper berries.
“ olje,	Oil of juniper berries.
“ empyrematisk,	Oil of juniper, empyrematic.
Enerbaertraeolje,	Oil of juniper wood.
Enerbaerthe,	Juniper tea.
Engelsk Heftplaster,	Court plaster.
“ Blegpulver,	Chlorinated lime.
“ Salt,	Magnesium sulphate.
“ Charpi,	Lint.
Enzianrod,	Gentian root.
“ tinctur,	Tincture of gentian.
Extract Aconit,	Extract of aconite.
“ Braekrod,	“ of ipecac.
“ Bregnerod,	“ of male fern.
“ Bomuldrodbark,	“ of cotton root.
“ Bulmeurt,	“ of henbane.
“ Bridsel,	“ of log wood.
“ Enzianrod,	“ of gentian.
“ Raevekage,	“ of nux vomica.
“ Rhabarber,	“ of rhubarb.
“ Fingerbölleblade,	“ of digitalis.
“ Lövetand,	“ of taraxacum.
“ Lakrits,	“ of licorice.
Faaretalg,	Mutton tallow.
Faeldet Kridt,	Precipitated carbonate calcium.
Falsk Senna,	Bladder senna.
Feberurt, amerikansk,	Fever root.
Fedt, Björne,	Bears' grease.
“ Svine,	Lard.
Fennekelfrö,	Fennel seed.
“ olje,	Fennel oil.
“ vand,	Fennel water.
Fersken,	Peach.
Figen,	Fig.
Fingerbölle blade,	Digitalis leaves.
“ tinctur,	Tincture of digitalis.
Fiskeben, hvid,	Fish bone (*Ossa sepiæ*).
Fiskekjerner,	Fish berries.
Fluer, spansk,	Cantharides.
Flueswamp,	Fly fungus (*Agaricus muscarius* L.).
Fordelende urter,	*Species resolventes.*
Fortyndet Chlorvandstofsyre,	Hydrochloric acid, dil.
Fortyndet Phosphorsyre,	Phosphoric acid, dil.
“ Salpeter-aether,	Sweet spirits of nitre.

Fortyndet Svovlsyre,	Sulphuric acid, dil.
Frö, Bukkehorn,	Fenugreek.
“ Bulmeurt,	Henbane seed.
“ Hampe,	Hemp seed.
“ Hör,	Linseed.
“ Kanarie,	Canary seed.
“ Kardemome,	Cardamom seed.
“ Luse,	Sabadilla seed.
“ Orme,	Worm seed.
“ Petersille,	Parsley seed.
“ Pigaeble,	Stramonium seed.
“ Roe,	Rape seed.
“ Tidlöse,	Colchicum seed.
“ Vandfennekel,	Water hemlock.
Fruehaar,	Venus hair (*Adiantum capillus Veneris* L.).
Frugter, Valmue,	Poppy.
Fyrswamp,	Surgeons agaric (*Polyperus fomentaries* Fries).
Galaebler,	Nutgall.
Galaeblesyre,	Tannic acid.
Galangarod,	Galanga root.
Gambir-katchu,	Pale catechu.
Galmeiesten,	Calamine.
Garver-sumak,	Curriers' sumach.
Garvesyre,	Gallic acid.
Gentianrod,	Gentian root.
Gibs, braendt,	Plaster Paris.
Gigtpapir,	Antirheumatic paper.
Gift-sumak,	Poison oak.
Gilleniarod,	American Ipecac.
Gjedeurt,	Goats' rue.
Gjaer,	Ferment, yeast.
Gjögemad,	Oxalis.
Gjögesyre,	“
Glasurt,	Wall pellitory.
Goepulver,	Goa powder.
Granataebler,	Pomegranate.
Granataeblerodbark,	Pomegranate root bark.
Graeskarfrö,	Pumpkin seed.
Grön Vitriol,	Sulfate of iron, impure.
Guajac-harpix,	Guaiac resin.
Guajactrae,	Guaiac wood.
Guldsvovl,	Sulphide of antimony.
Guds Raades Urt,	Hedge hysop.
Gulerod,	Carrot.
Guldris,	Golden rod.
Gult Vox,	Yellow wax.
Gummi, Ammoniak,	Gum resin ammoniac.
“ Arabisk,	Acacia.
“ Gutt,	Gamboge.
“ Lacca,	Shellac.
“ Slim,	Mucilage.
“ Tragacant,	Gum tragacanth.
Gurgemerod,	Tumeric.
Haller sure Draaber,	*Liquor acidus Halleri.*
Hampefrö,	Hempseed.
Hamp, Canadisk,	Canadian hemp.
“ Indisk,	Indian hemp.
“ Nesle,	Hemp nettle.
Hanefodurt,	Crowfoot.
Harpix, Guaijak,	Guaiac resin.
“ Jalapa,	Jalap resin.
“ Kino,	Kino.
“ Salve,	Resin cerate.
Havregryn,	Oat meal.
Heftplaster,	Courtplaster.
Helvedsten,	Silver nitrate.
Hestehale,	Horsetail.
Hestehovblade,	Colts foot.
Hestekastaniebark,	Horsechestnut bark.
Hestemynte,	Horsemint.

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[*] Copyrighted. Continued from p. 200.

Hestemynteolje,	Horsemint oil.
Hesterumpe,	Horsetail.
Hexemel,	Lycopodium.
Hjertestyrkende Draaber,	Compound spirit of lavender.
Hjortetakdraaber,	*Liquor cornu cervi succin.*
" salt,	Ammonium carbonate.
Hoffmannsdraaber,	Hoffmann's anodyne.
" röde,	*Balsamum vitæ Hoffmanni.*
Honning,	Honey.
" renset,	Honey, pure.
Hostemixtur,	Cough mixture.
Hostepulver,	*Massa pilulæ cinoglossæ.*
Hostesaft,	Cough syrup.
Hylde blomster,	Elder flowers.
" the,	" "
" vand,	Elder flower water.
Humle,	Hops.
Hundegraes,	Cough grass.
Hunderose,	Dog rose.
Hundetunge,	Hound's tongue.
Hundetrae,	Dogwood.
Hundredbladet Rose,	Hundred-leaved rose.
Husblas,	Isinglass.
Hvalrav,	Spermaceti.
" salve,	" salve.
Hvid Camphorolje,	Camphor liniment.
" Kviksölvpræcipitat,	White precipitate.
" Mixtur,	Chalk mixture.
" Spansk Saebe,	Castile soap, white.
" Lög,	Onion.
" Vox,	White wax.
" Vitriol,	Zinc sulfate.
Hvedestivelse,	Wheat starch.
Högblomster,	Hawk weed.
Hörfrö,	Linseed.
" mel,	Linseed meal.
" " omslag,	Linseed poultice.
" olje,	Linseed oil.
Igle,	Leech.
Ignatiusbönner,	St. Ignatius bean.
Iberiskarse,	Peppergrass (*Lepidium iberis* L.).
Infus,	Infusion.
" pomerants skaller,	" of orange peel.
" sennablade,	" of senna leaves.
Indigo, vild,	Wild indigo.
Indisk Hamp,	Indian hemp.
" Sarsaparillerod,	Indian sarsaparilla root.
Indisk Urt,	Wild yam.
Indspröitning,	Injection.
Ingefaer,	Ginger.
" tinctur,	Tincture of ginger.
Islandsk Lav,	Iceland moss.
" Mos,	Iceland moss.
Isop,	Hyssop.
Jalapaharpix,	Jalap resin.
Jalaparod,	Jalap.
Jamaikapeber,	Allspice.
Jern-ammoniak, citronsurt,	Iron and ammonium citrate.
Jern-ammoniak, svovlsurt,	Sulfate of iron and ammonium.
Jerncitrat,	Iron citrate.
Jernchinavin,	*Vinum chinæ ferr. ph. N.*
Jern, dialyseret,	Dialysed iron.
Jernets Testamente,	*Spec. ad long vitum.*
Jernoxyd,	Iron oxide.
" melkesurt,	Iron lactate.
Jernjodid,	Iron iodide.

Jernoxydul, arseniksurt,	Iron arsenite.
" chinin-citronsurt,	Iron and quinine citrate.
" strychnin-citronsurt,	Iron and strychnine citrate.
" baldriansurt,	Iron valerianate.
" citronsurt,	Iron citrate.
" kulsurt,	Iron carbonate.
" kulsurt, med sukker,	Saccharated iron carbonate.
" fugtigt (hydrat),	Hydrated iron oxide.
" oxalsurt,	Iron oxalate.
" phosphorsurt,	Iron phosphate.
" svovlsurt,	Iron sulphate.
Jern, reduceret,	Reduced iron.
Jernplaster,	Iron plaster.
Jernoxydul-ammoniak, vinsurt,	Iron and ammonium tartrate.
Jernoxydul-kali, vinsurt,	Iron and potassium tartrate.
Jernoxydul, magnetisk,	Magnetic iron oxide.
Jernvinsten,	Iron and potassium tartrate.
Jernvitriol,	Iron sulfate, impure.
Jod,	Iodine.
Jod-ammonium,	Ammonium iodide.
" bly,	Lead iodide.
" kadmium,	Cadmium iodide.
" jernpiller,	*Pilulæ ferri iodati* Ph. N.
" kalium,	Potassium iodide.
" methyl,	Methyl iodide.
" natron,	Sodium iodide.
" stivelse,	Starch iodide.
Jodvandstofsyre,	Hydriodic acid.
Johannesbröd,	St. John's bread.
Jordrög,	Fumitory.
Jödekirsebaer,	Wintercherry.
Kaffe,	Coffee.
Kaffebönner,	Coffee beans.
Kalk, braendt,	Calcium oxide.
Kalk,	Lime.
" Chlor,	Chlorinated lime.
" Jod,	Calcium iodide.
" precipiteret,	Precipitated calcium carbonate.
" underphosphorsyrlig,	Calcium hypophosphite.
" liniment,	Lime liniment.
" vand,	Lime water.
Kalmusröd,	Sweet flag.
Kajeputolje,	Cajeput oil.
Kalabarbönner,	Calabar beans.
Kainkarod,	Cahinca root.
Kakao bönner,	Cacao beans.
" smör,	Cacao butter.
Kalium, Brom,	Potassium bromide.
" Ferrocyan,	" ferrocyanide.
" Jod,	" iodide.
" Chlor,	" chloride.
" Svovl,	Sulphureted potassa.
" underphosphorsyrlig,	Potassium hypophosphite.
Kali, citronsurt,	Potassium citrate.
" chlorsurt,	" chlorate.
" eddikesurt,	" acetate.
" kaustisk,	Caustic potash.
" manganoversurt,	Potassium permanganate.
" phosphorsurt,	Potassium phosphate.
" svovlsurt,	" sulphate.
" svovlsyrligt,	" sulphite.
" dobbelt chromsurt,	" bichromate.

(To be continued.)

Early Phases in the Development of Pharmaceutical Legislation in Wisconsin.*

By *Edward Kremers.*

On the same day the "Seebote" contains an unsigned communication, the author of which could not be ascertained thus far. [*Document 7.*] The author not only criticizes the style of the first communication in the "Seebote," but considers the demands to be made on the future druggist as excessive. He is of the opinion that the chemical factories had greatly simplified the duties of the druggist, that the danger of an error would be greatly diminished if physicians were compelled to write distinctly, and that the time had passed when people regarded an illegible recipe as something bordering on the miraculous.

Pharmacy of Mr. Stotzky in Klattau. Equipped in 1733.

(From a photograph. Peters: Aus Pharm. Vorzeit, I, p 82.)

Meanwhile, a number of other druggists began a counter demonstration. Just what the motives of these men were it has been impossible to ascertain thus far. Possibly these lines will cause one or more of them to make known who began this counter movement. One of the prime motives of the persons initiating this counter movement seems to have been the desire to have all persons at that time occupied in the retail drug business included in a city organization or recognized by any legislative act that might result from such organized effort.

On Friday, Sept. 17, the "Banner und Volksfreund" briefly calls attention to this counter-demonstration. [*Document 8.*] Whereas the reporter seems to regret that the men who originated the movement should have made enemies among their own fraternity by so doing, he also realizes the necessity for more general action. "It is of little use", he says, "if twenty apothecaries who are members of the society live up to their rules, while thirty others pay no attention whatever to them." A meeting appears to have been held on this day. Where it was held and who were its officers the writer has been unable to learn thus far. It is possible also that one or several druggists wrote the petition, later on submitted to the Common Council, and secured the signatures of the other druggists.

The petition just referred to and signed by twenty-four druggists (not twenty-two as the "Sentinel" states) appeared in various papers on Saturday the 18th. Naturally one may suppose that the petition addressed to the Common Council was written in the English language. It is therefore probable that the petition as given by the "Sentinel" [*Document 9.*] is the original one.* The account in the German papers, viz. in the "Seebote" [*Document 10.*], "Germania" [*Document 11.*], and "Banner und Volksfreund" [*Document 12.*], differ from each other in the wording of the petition. There is sufficient similarity of wording in the accounts given by the "Seebote" and "Germania" to lead one to suspect that a translation was submitted to the German papers, but that the editors used their own discretion in the matter of style. Possibly the account in the "Seebote" is the translation as submitted by the druggists.

On the following Monday, September 20, the petition was presented to the Common Council [*Document 13.*] and by it referred to the Board of Health and the City Attorney. The printed Proceedings of the Common Council do not indicate that the petition gave rise to questions or comment at this time. The various daily papers in reporting the proceedings of the council also make but a matter-of-fact report of the event. [*Document 14.*]

Document 7.

[*Der Seebote*, d, 17. Sept. 1875. (p. 4; col. 3.)]

(Eingesandt).

In diesen Tagen erschien in den deutschen Zeitungen Milwaukee's ein „Eingesandt," das wohlgeeignet war, die gebildete deutsche Gesellschaft unserer Stadt in eine gelinde Aufregung zu versetzen. Man las da nämlich einen Aufruf von zehn Apothekern, die sich selbst die prominentesten Milwaukee's nennen, unterzeichnet, der in einem Deutsch abgefasst war, wie man es wohl selten gedruckt findet; wenn ein Mann seine Gedanken auf dem Papier festsetzen will, um sie gedruckt der Oeffentlichkeit zu übergeben, sollte es doch wenigstens immer in einem Styl geschehen, vor dem kein Quintaner zu erröthen gezwungen wäre; wird nun aber von zehn gebildeten Männern ein Aufruf in einer solchen Fassung an viele andere gebildete Männer öffentlich erlassen, was müssen da in einem unbefangenen Deutschen, dem seine Muttersprache noch wirklich am Herzen liegt, für trostlose Gedanken unwillkürlich aufsteigen? In früheren Zeiten war es solchen Leuten, die sich durch ihre, oft

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* Continued from p. 203.

* Attempts made to secure the original petition in the city clerk's office have not been successful.

nur eingebildete, Gelehrsamkeit vor der grossen Menge auszeichnen wollten, eigen, Sätze zu konstruiren, deren Sinn anderen Leuten erst nach langem Nachdenken, manchmal auch selbst dann nicht klar wurde, jedoch findet man bei den Schlimmsten dieser Art, eine, wenn auch noch so eine verschrobene, Konstruktion. Aber in besagtem „Eingesandt“ war von Satzbildung keine blasse Spur. Ei! ei! ihr Herren, wohin soll's Volk gerathen, wenn von den „Gelehrten“ der Nation die Muttersprache so misshandelt wird?

Was den Inhalt des genannten verunglückten Schriftstücks anbetrifft, so kommt dem Einsender dieses, der zwar kein Apotheker, jedoch mit der amerikanischen Apothekerei ziemlich vertraut ist, eine Forderung desselben höchst sonderlich vor. Wesshalb wird von denen die dem Verein beitreten wollen, eine fünfzehnjährige absolute Recepturthätigkeit oder ein Staatsexamen verlangt? Eine fünfzehnjährige Recepturthätigkeit! Wenn ein junger Mensch mit einer einigermassen guten Schulbildung nicht im Stande ist, binnen fünf Jahren das zu lernen, was zur selbständigen Führung einer Apotheke hier in Amerika nothwendig ist, dann lernt er's überhaupt nicht. Jeder der die Art und Weise, wie hier die Medizinen zubereitet werden, kennt, Jeder, der weiss, wie sehr die jetzt bestehenden chemischen Fabriken das Geschäft des Apothekers vereinfacht haben, wird diesem Urtheil beipflichten müssen. Sehr wünschenswerth wäre, dass die Herren Aerzte sich bei Abfassung ihrer Recepte einer deutlicheren Handschrift befleissigen möchten, dadurch könnte vielen Missgriffen vorgebeugt werden, und sollte auf Beseitigung dieses Zopfes, der von Alters her noch an der medizinischen Wissenschaft herumbummelt, vor allen Dingen von den Betheiligten hingearbeitet werden.

Die Zeiten, in denen das Publikum vor einem unlesbaren Zettel ehrfurchtsvoll staunend stand, ja in den es glaubte, von wirklich guten und gelehrten Aerzten würden nur solche Zettel geschrieben, sind hoffendlich endlich einmal vorüber. Also, was die Aufnahme in den Verein anbetrifft, so wäre an dieser Stelle vorläufig nur noch darauf aufmerksam zu machen, dass es gerade hier in Milwaukee viele recht tüchtige und durchaus gewissenhafte Apotheker giebt, die zwar kein Examen gemacht und auch noch nicht fünfzehn Jahre hinter'm Recepturtische gestanden haben, die jedoch seit Jahren ihre Apotheken zur grössten Zufriedenheit des betreffenden Publikums verwaltet. Warum sollen diese von dem Verein ausgeschlossen werden? — —

Document 8.

[*Banner und Volksfreund*, Freitag, 17. Sept. 1875. (p. 4, col. 5.)]

Die Apotheker haben, wie im „Banner“ bereits gemeldet, zum Schutze des Publikums einen Verein gegründet, der kaum entstanden ist und schon angefeindet wird. Der von den Herren Apothekern angestrebte Schutz lässt sich allgemein nur im Wege der Gesetzgebung durchführen. Es nützt wenig, wenn zwanzig Vereinsapotheker die Satzungen des Vereins befolgen und dreissig andere sich nicht daran kehren.

Document 9.

[*Sentinel*, Saturday, Sept. 18, 1875. (p. 8, col. 2.)]

Qualified Druggists.

Twenty-two of the most prominent drug firms of the city have signed the following petition to the Common Council:

We, the undersigned druggists of the city of Milwaukee, would respectfully represent that a suitable law be passed in this city, regulating the keeping of shops for the purpose of retailing drugs, medicines and such chemicals as are used in compounding medicines; and persons engaged in the business of compounding and putting of prescriptions of physicians, and vending medicines, either as proprietor, agent or assistant, without first having obtained a certificate of qualification and competency, after due and impartial examination for such business by a board of commissioners to be provided for such purpose, consisting of three physicians and one druggist, and the undersigned do further pray that the laws now existing regulating the sale of poisons be strictly enforced.

The great number of errors now occurring in compounding physicians' prescriptions and in vending medicines, which have produced so many fatal results throughout the United States are always caused by persons incompetent to be in a drug store, and many such mistakes and deaths will occur in the future, unless suitable laws are passed, with heavy fines attached, preventing incompetent persons to engage in such business.

[No signatures.]

Document 10.

[*Der Seebote*, Samstag, 18. Sept. 1895. (p. 4, col. 3.)]

An den ehrenwerthen Mayor und Common Council von Milwaukee.

Unterzeichnete Apotheker hiesiger Stadt ersuchen Sie, dahin zu wirken, dass ein passendes Gesetz erlassen werde, welches den Detailverkauf von Droguen, Arzneien und Chemikalien in Milwaukee regulirt.

Ferner, das sämmtliche Personen, welche dem Apothekerberufe hier nachkommen, von einer kompetenten Kommission examinirt werden, um zu konstatiren, ob dieselben die zu diesem Geschäfte nöthigen Fähigkeiten besitzen. Zum Schutze des Publikums halten wir obige Massregeln zweckmässig.

Achtungsvoll

John H. Tesch,
J. N. Morton,
J. M. Allcott,
Henry Fess, Jr.,
E. L. Babcock,
John A. Dadd,
L. H. Wehmer,
P. L. Dohmen,
Louis Kalkhoff,
J. Vertessy,
Christian Widule,
G. T. Platzer,
H. C. Beverung,
H. J. L. Meyer,
Rudolf Mieding,
Otto Schorse,
A. F. Kalkhoff,
Theo. Mueller,
H. Hackendahl,
Dr. C. Weise,
Strohmeyer & Co.,
F. Esau;
Amand Wirth,
Chas. J. Engel.

Document 11.

[*Germania*, Samstag, 18. Sept., 1875. (p. 3, col. 2.)]

An den ehrenwerthen Mayor und Stadtrath von Milwaukee.

Unterzeichnete Apotheker hiesiger Stadt ersuchen Sie, dahin zu wirken, dass ein passendes Gesetz erlassen wird, welches den Kleinverkauf von Droguen, Arzneien und Chemikalien in Milwaukee genau festgestellt.

Ferner, dass sämmtliche Personen, welche das Apothekergewerbe hier betreiben, von einer aus Fachkennern bestehenden Commission geprüft werden, um zu sehen, ob dieselben die zu diesem Geschäfte nöthigen Fähigkeiten besitzen. Zum Schutze des Publikums halten wir obige Massregel für zweckdienlich.

Achtungsvoll

[Same signatures as in Seebote, but Wiese, not Weise.]

Document 12.

[*Banner und Volksfreund*, Samstag, 18. Sept. 1875. (p. 4, col. 3.)]

Das Apothekergewerbe.

Es ist unter den hiesigen Apothekern eine Bewegung im Gange, welche eine allgemeine gesetzliche Ueberwachung des Gewerbes insoferne anstrebt, als jeder Apotheker sich einer Prüfung zu unterziehen hat, ehe ihm die Ausübung des Gewerbes gestattet wird. Wir überzeugten uns gestern, dass die meisten Apotheker, deutsche und englische, an der Bewegung Theil nehmen.

Sie richteten folgende Zuschrift an den Mayor und Stadtrath:

Die Unterzeichneten, Apotheker in der Stadt Milwaukee, stellen Ihnen achtungsvoll vor, dass ein zweckdienliches Gesetz zur Regelung des Kleinhandels mit

Droguen, Arzneien und solcher Chemikalien, welche bei der Zusammensetzung von Arzneien Verwendung finden; erlassen werden sollte. Alle bei dem Gewerbe mit der Anfertigung von Medizinen nach ärztlichen Recepten beschäftigte Personen, sei es als Eigenthümer, Agent oder Gehilfe, müssen sich einer gründlichen und unparteiischen Prüfung vor einer zu diesem Zwecke aufgestellen Prüfungscommission unterziehen, bestehend aus drei Aerzten und einem Apotheker. Die Unterzeichneten bitten ferner, dass die zur Regelung des Gift Verkaufes in Kraft bestehenden Gesetze strenge vollstreckt werden.

Die bei der Anfertigung und beim Verkaufe von Arzneien in ganz Amerika sehr häufig vorkommenden Verstosse, welche oft die schrecklichsten Folgen nach sich ziehen, geschen von Personen, die für das Apothekergewerbe nicht tauglich sind. Wenn dem Unfug auf gesetzlichem Wege und unter Androhung schwerer Strafen nicht begegnet wird, so werden Todesfälle in Folge von Verstössen bei der Arzneibereitung stets zu beklagen sein.

[Same signatures as in Seebote but in different order.]

Document 13.

[Proc. of the Com. Council of the Cy. of Milw. for the year ending Sept. 20, 1875, p. 166.]

Petitions presented.

By this chair, from John H. Tesch and other druggists of the city, which represented that a law should be passed to regulate in this city, the sale of drugs and medicines, and the compounding of physicians' prescriptions, and issuing of certificates to all persons employed therein, and praying that the laws regulating the sale of poisons, should be strictly enforced.

Referred to the Board of Health and the City Attorney.

[*Banner und Volksfreund*, Dienstag, 21. Sept. 1875. (p. 4, col. 2.)]

Stadtverwaltung.

Ein Gesuch von hiesigen Apothekern um Einsetzung einer Commission zur Prüfung von Apothekern und strikte Durchführung der bezüglich des Gifteverkaufs bestehenden Gesetze. Das Gesuch wurde verflossene Woche bereits wörtlich im „Banner" veröffentlicht. An den Gesundheitsausschuss und den Stadtanwalt verwiesen.

Document 14.

[*Sentinel*, Tuesday morning, Sept. 21. 1875. (p. 3, col. 2.)]

The Council.

The memorial of J. H. Tesch, and other prominent druggists, for strict regulations of the sale of poisons, was received and referred.

[*Germania*, Dienstag, 21. Sept., 1875. (p. 3, col. 2.)]

Stadtraths-Verhandlungen.

Eine Petition von Apothekern dieser Stadt für Erhaltung eines Gesetzes zur Regulirung des Verkaufs und der Zusammensetzung von Medizinen. An das Justizcomite, den Stadtanwalt und den Gesundheitsrath verwiesen.

[*Herold*, Sept. 21, 1897, (p. 3, col. 4).]

Stadtverwaltung.

Ferner wurde von Herrn Benjamin folgende Petition eingereicht:

An den ehrenwerthen Mayor und Common Council von Milwaukee.

Unterzeichnete Apotheker hiesiger Stadt ersuchen Sie, dahin zu wirken, dass ein passendes Gesetz erlassen werde, welches den Detailverkauf von Droguen, Arzneien und Chemikalien in Milwaukee regulirt.

Ferner, dass sämmtliche Personen, welche dem Apothekerberufe hier nachkommen, von einer competenten Commission examinirt werden, um zu constatiren, ob dieselben die zu diesem Geschäfte nöthigen Fähigkeiten besitzen. Zum Schutze des Publikums halten wir obige Massregeln für zweckmässig.

Achtungsvoll
(folgen die Unterschriften).

An den Board of Health und den Stadtanwalt verwiesen.

[*Seebote*, d. 22. Sept. 1875, (p. 4, col. 4.)]

Stadtrathsverhandlungen.

Der Vorsitzer unterbreitete eine Zuschrift von John H. Tesch und anderen Apothekern, worin es heisst, dass behufs Regelung des Verkaufs von Droguen und Arzneien, der Zubereitung von Arzneien nach ärztlichen Rezepten und der Ausstellung von Zertifikaten an alle im Apothekerfache beschäftigten Personen dahier ein Gesetz erlassen werden sollte. Gleichzeitig wird um Durchführung der den Giftverkauf betreffenden Gesetze ersucht.

Der Sanitätsbehörde und dem Stadtanwalt zugewiesen.

(To be continued.)

Chemical Bibliography of Morphine. 1875—1896.*

By *H. E. Brown*, B. S.

Godefroy, R. 1877.

Arch. der Pharm. (3), 9, p. 434; J. Chem. Soc. 32, p. 365; Ber. 9, p. 1792.

Some New Reactions for Alkaloids.

A precipitate is produced by adding stannous chloride to a hydrochloric solution of morphine. It has the following composition: $SnCl_2.C_{17}H_{19}NO_3HCl$.

Schmidt, Ernst. 1877.

Ber. 10, p. 194; J. Chem. Soc. 17, p. 343; Chem. Centrbl. 1877, p. 247.

Morphine Hydrobromide and Hydriodide.

Statements as to the solubility and composition of these salts being quite contrary to each other, the author makes an examination of them and finds that the hydriodide has the composition $C_{17}H_{19}NO_3.HI + 2H_2O$. The crystals are sparingly soluble in cold and more freely in hot water.

Morphine hydrobromide has a similar composition and solubility.

Pellagri, G. 1877.

Gazz. chim. ital. 7, p. 297; J. Chem. Soc. 17, p. 808; Ber. 10, p. 1384; Chem. Centrbl. 1877, p. 662; Pharm. J. Trans. 8, p. 570.

New Reaction for Morphine.

Characteristic color reactions are produced by dissolving in concentrated hydrochloric acid and then adding sulphuric acid and evaporating at 100°—120° on an oil bath.

Buri, E. 1878.

Ztschr. anal. Chem. 17, p. 185; J. Chem. Soc. 34, p. 755; Chem. Centrbl. 1878, p. 601.

Testing for Morphine.

Spontaneous evaporation of the amyl alcohol solution of morphine is preferred to the Stas-Otto method, for large and well-developed crystals are obtained by the former procedure.

Blyth, A. Winter. 1878.

J. Chem. Soc. 33, p. 313; Ber. 11, p. 996.

The Temperatures at Which Some of the Alkaloids Sublime as Determined by an Improved Method.

A subliming cell is used consisting of two microscopical discs and a ground glass ring placed between them, the whole resting on a metallic solid into which the bulb of the thermometer dips.

Morphine at 150° clouds the upper disc with nebulæ or dots of the sublimed substance; at 188° crystals are formed.

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* Continued from p. 205.

Lindo, D. 1878.
Chem. News 37, p. 158; J. Chem. Soc. 34, p. 678; Ber. 11, p. 997.

Action of Ferric Chloride and Sulphuric Acid on Opium Bases.

By treating a small quantity of morphine with sulphuric acid and ferric chloride and gently heating, an intense indigo blue coloration is produced.

Lindo, D. 1878.
Chem. News 38, p. 65; J. Chem. Soc. 34, p. 1013.

Morphine Reactions.

A test solution of copper sulphate in ammonia is prepared according to specific directions. This gives with neutral morphine sulphate a distinctive color.

Phenol is the only colorless organic compound which gives a similar color reaction.

Greenish, H. G. 1878.
Pharm. J. Trans. 9, p. 240.

Morphine Reaction.

The author points out that the new reaction given by Lindo is a reaction that was reported by Nadler in 1873.

Schiff, H. 1878.
Ber. 11, p. 834; J. Chem. Soc. 34, p. 668.

Aldehyde Derivatives of Amides and Carbamides.

Vegetable alkaloids do not form aldehyde derivatives.

Heintz, E. 1878.
Ztschr. anal. Chem. 1878, p. 166; J. Chem. Soc. 34, p. 613; Ber. 11, p. 984.

Detection of Organic Poisons.

The author recommends the use of purified bole for solutions from which the alkaloids are to be extracted. He claims that fatty, resinous and other adhesive bodies are thus removed.

Lynn, J. 1878.
Am. J. Pharm. (4), 6, p. 358; Chem. Centrbl. 1878, p. 158; J. Chem. Soc. 34, p. 612.

Morphine Determinations.

This is a comparison of Procter's-Staple's, Mohr's, Hager's-Jacobson's and Dragendorff's-Mayer's methods for determining morphine. Of the gravimetric methods Staple's gives much the purest and best crystalline morphine, while the greatest exactness is attainable by the volumetric method of Dragendorff and Mayer.

Kosmann, C. 1878.
Bull. Soc. chim. Par. (NS), 30, p. 145; Chem. Centrbl. 1878, p. 693.

The Changing of Morphine into Glucose.

By treating morphine with potassium permanganate, glucose and nitric acid are formed. These two bodies are probably the only ones formed.

Prescott, A. B. 1878.
Proc. Am. Pharm. Assoc. 26, p. 823; Pharm. J. Trans. (3), 10, p. 66; J. Chem. Soc. 38, p. 193.

Valuation of Tincture of Opium.

The opium in twelve different samples of the tincture is determined. Hager's and Staple's methods were used separately on every sample in order to determine the value of the two methods.

The best crystals were obtained by Staple's process; but it is not considered to be preferable to the method of Hager.

Prescott, A. B. 1878.
Proc. Am. Pharm. Assoc. 26, p. 807; Pharm. J. Trans. (3), 10, pp. 128 and 182; J. Chem. Soc. 38, p. 191.

Morphiometric Processes for Opium.

A modified Hager-Jacobsen's method for the assay of opium is given.

A preliminary washing with benzene is for the purpose of removing impurities.

The author also gives a comparison of the different methods generally in use and the reliability of the same.

Petit, A. 1879.
J. de pharm. (4), 29, p. 159*; Chem. Centrbl. 1879, p. 363; Pharm. J. Trans. 9, p. 937.

Estimation of Morphine in Opium.

A method is given for the rapid estimation of morphine in opium, which is sufficiently exact for all common purposes.

A second method is given for use when more exact determinations are required.

Yvon. 1879.
J. de pharm. (4), 29, p. 332*; Chem. Centrbl. 1879, p. 363.

Estimation of Morphine in Opium.

The author gives a review and criticism of the known methods.

Fleury, G. 1879.
J. de pharm. (4), 29, p. 341*; Chem. Centrbl. 1879, p. 363.

Estimation of Morphine in Opium.

The author calls attention to the article by Petit in the J. de pharm. (4), 29, p. 159, and claims that it is only a modification of the method given by him in the year 1867.

Brown, D. 1879.
Med. Times and Gazette, 2, p. 79; Pharm. J. Trans. (3), 9, p. 70; J. Chem. Soc. 36, p. 70.

Action of Iodic Acid, Sulphomolybdic Acid and Ferric Chloride on Morphine and other Substances.

This is mainly an investigation of the color reactions produced by the above reagents on morphine.

Flückiger. 1879.
Pharm. J. Trans. 10, p. 254.

Note on the Estimation of Morphine in Turkey Opium.

The author gives a simple process for the determination of morphine in Turkey opium.

Meyer, A. 1879.
Arch. der Pharm. (3), 13, p. 413; J. Chem. Soc. 36, p. 269; Ber. 12, p. 271.

Absorption Spectra of Solutions of Brucine, Morphine, Strychnine, Veratrine and Santonine in Concentrated Acids.

Drawings of the spectra are given as produced by different strengths of solutions.

The green solution of morphine in hot sulphuric acid, which allows the red to pass through, absorbs the light very strongly by the presence of traces of nitric acid, and allows when diluted more of the yellow and violet rays to pass, while at the same time assuming a beautiful red color.

Smith, Watson. 1879.
J. Chem. Soc. 36, p. 831; Ber. 12, p. 422.

Characteristic Color Reactions Produced by the action of Antimony or Bismuth Trichloride on the Aromatic Hydrocarbons.

With morphine in considerable quantities a faint greenish color is produced by antimony or bismuth trichloride.

Fraude, G. 1879.
Ber. 12, p. 1558; J. Chem. Soc. 38, p. 69.

Perchloric Acid as a Test for Alkaloids.

Perchloric acid of specific gravity 1.13—1.14 has no action on morphine.

Iodic anhydride and sulphuric acid give with morphine a deep violet, then an orange brown color.

Losch, A. 1879.

Pharm. Ztschr. f. Russl. 1879, 18, p. 546*; Chem. Centrbl. 1879, p. 826.

The Quantitative Estimation of the Alkaloids of Plants.

A very complete method for the estimation of the alkaloids in plants with reasons for each step is given.

Bell, J. C. 1880.

Analyst, 1879, p. 181; J. Chem. Soc. 38, p. 68.

Iodic Acid as a Test for Morphine.

Iodic acid is shown to be a very unsatisfactory agent for morphine.

Wright, C. R., and Rennie, E. H. 1880.

J. Chem. Soc. 37, p. 609; Ber. 1880, p. 1996; Chem. Centrbl. 1880, p. 570; Bull. Soc. chim. 1882, (I), p. 237; Pharm. J. Trans. 10, p. 1049.

Influence of Benzoyl Chloride on Morphine.

Benzoyl chloride on morphine produces a di- and not a tribenzoylated base as claimed by K. Polstorff (Ber. 1880, p. 98).

Polstorff, K. 1880.

Ber. 13, p. 86; J. Chem. Soc. 38, p. 408; Chem. Centrbl. 1880, p. 134; Bull. Soc. chim. 1880, (2), p. 708.

Action of Potassium Ferricyanide on Morphine.

A method for the formation of oxydimorphine is given together with a study of its sulphate and hydrochloride.

It is thought that in the formation of oxydimorphine from morphine an atom of hydrogen splits off from each of two molecules of morphine and then union takes place between these morphine residues.

Brockmann, K., and Polstorff, K. 1880.

Ber. 13, p. 88; J. Chem. Soc. 38, p. 408; Chem. Centrbl. 1880, p. 134.

Schutzenberger's Oxymorphine.

Schutzenberger's oxymorphine, to which he gave the formula $C_{17}H_{19}NO_4$, proves on closer investigation by the author to be oxydimorphine $C_{34}H_{36}N_2O_6$.

Brockmann, K., and Polstorff, K. 1880.

Ber. 13, p. 91; J. Chem. Soc. 38, p. 408; Chem. Centrbl. 1880, p. 134.

Potassium Permanganate on Morphine.

Flückiger states that oxymorphine is formed by the action of potassium permanganate on morphine. The authors find that oxydimorphine is what is formed in this reaction.

Brockmann, K., and Polstorff, K. 1880.

Ber. 13, p. 92; J. Chem. Soc. 38, p. 408; Chem. Centrbl. 1880, p. 134.

Oxydimorphine.

Oxydimorphine is obtained when an ammoniacal solution of morphine is exposed to the air.

Polstorff, K. 1880.

Ber. 13, p. 93; J. Chem. Soc. 38, p. 408; Chem. Centrbl. 1880, p. 134; Bull. Soc. chim. 1880, (2), p. 710.

Action of Potassium Ferricyanide on Methylmorphine Iodide.

The author has prepared the following morphine compounds:

Basic iodide of methyloxydimorphine, $(C_{17}H_{18}NO_3)_2CH_3I.CH_3OH$.
Basic methyloxydimorphine hydroxide, $(C_{17}H_{18}NO_3CH_3)_2OHI+5H_2O$.
Neutral sulphate, $(C_{17}H_{18}NO_3CH_3O)_2SO_2+4H_2O$.
Methyloxydimorphine hydroxide, $(C_{17}H_{18}NO_3CH_3OH)_2+7H_2O$.

(To be continued.)

MONTHLY REVIEW.

Chemistry.

Ethylamine.

In his studies concerning the combinations of uric acid with organic bases, C. Goldschmidt concluded to divide these compounds into two groups with respect to their water solubility. To the first group, whose members are only soluble in hot water, belong the compounds of uric acid with methylamine, benzylamine, nicotine, tetrahydroisoquinoline, etc. The urates of the second group are fairly soluble in cold water; they include the uric acid compounds of piperidine, ethylamine and propylamine. The solubility of piperidine urate is 5.3 p. in 100 p. water at 17° C.; that of the other two members of this group is about the same. For practical reasons ethylamine has been chosen as a remedy in the treatment of gout and bladder-stones.

[Chem. Ztg., 1897, p. 544; Pharm. Centralh., 1897, p. 465.]

The Comparative Value of Antiseptics.

A. Gawalowski has brought together in tabulated form a statement of the comparative value of a number of disinfectants, ranking them according to their efficiency as disinfectants, antiseptics and deodorizers. In this table, corrosive sublimate is taken as a standard for comparison with a value of 100.

Substance.	Disinfectant.	Antiseptic.	Deodorizer.
½ % Corrosive sublimate sol.	100	100	—
Carbolic acid (100%)	50	50	40
Sulphurous acid (gas)	50	50	50
Thymol (solid)	50	50	40
Creosote (100%)	50	50	40
Antimony (Bayer)	50	50	40
Iron vitriol (cryst.)	40	50	30
Ferrous zinc sulphate (cryst.)	40	50	40
Iron oxide	40	10	15
Ferrous zinc magnesium sulphate (cryst.)	40	30	30
Copper zinc sulphate (cryst.)	35	40	40
Ferrous zinc cupric sulphate (cryst.)	35	35	40
Zinc phenolate (dry)	30	40	45
Sulphites (10—40%)	15–25	15–25	15–25
Permanganate (solid)	25	10	50
Salicylates (solid)	25	25	25
Creolin	25	25	40
Lysol	25	25	40
Chlorine (gas)	15	—	50
Ferrous zinc calcium sulphate (cryst.)	15	30	40
Ferric salts (40–50% solutions)	10	10	5
Zinc salts (cryst.)	10	—	40
Calcium chloride	5	—	15

[Pharm. Post, 1897, p. 363.]

Homeophatic Dilutions in the Light of Physical Chemistry.

Prof. Ostwald of Leipzig, has recently published an article on the "Formation and Transformation of Solid Bodies." His results are of pharmaceutical interest in so far as he used homeophatic triturations and determined their activity in a physical chemical manner. Prof. Ostwald's results are very briefly given in the following.

A soluble solid body possesses the property of changing from a solid to a liquid state when brought in contact with a solvent, and after evaporation of a solvent to return to its original state. In the case of salts their return to the solid state is called recrystallization. When a solvent has taken into solution as much of the solid body as it can hold at a given temperature, the solution is said to be saturated for that temperature; but when the solvent has taken up a larger quantity, the solution is said to be supersaturated. The longer or shorter time during which this supersaturation is capable of existing is called overcooling. This overcooled condition can, as is well known, exist for a long time when the solution is carefully protected. The solution solidifies, however, to a mass of crystals when the smallest particle of a crystal of the dissolved substance is brought into contact with the solution. This crystal particle may be so small that it is not visible with the naked eye, and can scarcely be recognized with the microscope. Prof. Ostwald has experimented with these supersaturated and overcooled solutions in order to determine the amount of crystal substance necessary to produce crystallization. In order to obtain very minute crystalline particles he triturated the crystals with powdered quartz. For farther trituration he used absolutely pure milk sugar. The quantitative relation existing between the triturated substance and the indifferent vehicle was as follows.

1. Trituration, in 1 gram 1/10 gram.
2. " " 1 " 1/10 0 "
3. " " 1 " 1/10 00 "
4. " " 1 " 1/10 000 "
5. " " 1 " 1/10 000 0 "
6. " " 1 " 1/10 000 00 "
7. " " 1 " 1/10 000 000 "
8. " " 1 " 1/10 000 000 0 "
9. " " 1 " 1/10 000 000 00 "
10. " " 1 " 1/10 000 000 000 "

At first Prof. Ostwald put himself to the laborous task of making these triturations himself, but later he used the trituration machine of the homeophatic Centralapotheke in Leipzig. The perfectly uniform results obtained in the experiment described above were as follows: crystallization was induced when no higher than the 9th trituration was used. Several substances, like salol, would work with this trituration only when freshly prepared. When older, the 3rd trituration would still induce crystallization, but not the 4th. Only a single exception to this general law was found in the case of borax which induced crystallization as far as the 17th trituration. This result seemed so surprising to Prof. Ostwald that he made another series of triturations, using the greatest possible care. These new triturations gave the following result: the 9th trituration of borax is still active, the higher triturations are not, thus agreeing with the results obtained with the other substances.

Homeopathy, as is well known, goes far beyond the 9th trituration, as it puts physiological experiments on a higher plane than the chemical. Prof. Ostwald's experiments are, however, in favor of the activity of minute medicinal doses. For when the one thousand-millionth part of a gram is sufficient to produce such visible results as the solidification of a solution by the formation of crystals, we can hardly say that the 9th trituration contains no more of the active substance.

[Ztschr. f. Phys. Chemie 22, p. 289.]

Botany and Pharmacognosy.

A Useful Cactus.

Dr. Ochsenius says that in Chili, *Opuntia vulgaris*, *Juna* of the country, furnishes in its sticky juice the cement used in preparing a lime wash for the houses of Middle Chili. The authorities require this wash to be applied shortly before the day of the national celebration. [Natur, 1897. p. 227.]

A Neglected Source of Mucilage.

The okra, *Hibiscus æsculentus*, which grows luxuriently throughout the South, is very rich in mucilage. All parts abound in this principle and in view of the superior qualities of the constituent in this plant, it seems strange that it has not found a wider use. Except in the domestic practice of the negroes and creoles of the Gulf states, it seems to have found no place. When deprived of its cortex, the root furnishes a powder as white as snow, extraordinarily rich in mucilage, tasteless and far superior in every respect to marsh mallow. During the war, okra seed, parched and used either alone or in conjunction with dried and parched sweet potato, were used as a substitute for coffee. Sometimes the dried leaves of *Ilex cassine*, yaupon, were added to supply the stimulating effect of the caffeine contained in them. The plant itself, root and stalk, was used as soothing poultices for inflamed wounds.

[The National Druggist, 1897, p. 234.]

Saltpeter in Indian Millet.

Andropogon sorghum, known as Indian millet or durra, is a wellknown member of the Grass family growing either wild or cultivated in different parts of the world. It is an important plant since from its grain bread is made, from its floral panicles rice brooms are manufactured and its leaves furnish a green fodder for cattle.

In connection with this latter use it has long been known in India that continued dryness develops in the plant poisonous properties sufficiently marked to render it fatal to stock. The natives believe that a small insect which attacks the plant lends to it its toxicity. The English botanist, Anderson, denies the presence of a poisonous principle and regards its harmful action as a result of the operation of mechanical causes. In 1877, an unusually great mortality among the stock was observed. Recently Pease has taken up the investigation of the subject with very interesting results. He found in dry, depauperate *Andropogon* plants in the interior of the culm especially at the nodes considerable deposits of potassium nitrate. The plants were found to contain from 15 to 20 pounds of saltpeter. In order to test the action of saltpeter on animals, Pease gave a heifer 300 grams of the salt. Inside of twenty minutes, death occurred with symptoms like those seen to follow the use of the fodder in question. Pease believes the unusually large quantities of saltpeter occuring under certain conditions in this plant give to it this toxic action. Following the setting in of the rains and the resumption of growth, *Andropogon* is said to lose its poisonous properties. A strong assimilation of this salt must therefore occur.

[Natur, 1897. p. 227.]

Insect Powders of Commerce.

George R. Durrant has given the subject of insect powders a careful study and summarizes his results in the following terms.

The value of insect powder is in direct proportion to the combined amount of essential oil and soft acid resin, and in inverse proportion to the amount of chlorophyll, both statements to be read together.

A perfect sample of insect powder should pass a sieve having at least eighty meshes to the linear inch. The powder should yield 5.25 percent of combined essential oil and soft resin; chorophyll should be absent, or present in the merest trace.

The following method of testing the value of insect powders is described. Place 100 grains of the powder in the cylinder of a glass syringe (1 ounce). Powder should be pressed down compactly into a piece of absorbent cotton, to act as a filter. Moisten with ether, 7.35. Close top of syringe and macerate for 30 minutes. Percolation may then proceed, the powder being repercolated with the same fluid four times and finally washed through with sufficient ether to make up one fluid ounce. The resulting percolate should have a rich yellow color; if a pronounced green color be the result, the sample may be at once discarded. In absence of much green coloring matter, evaporate fluid carefully (temperature not exceeding 200° F,) and residue weighed in a tared watch glass. The resulting soft mass should not weigh less than 3.75 grains, and in finest samples reaches 5.6 grains, and should have the pleasant, characteristic odor of the flowers.

[Bull. of Pharm. 1897, p. 347; from Pharm. Journ.

Source of Kinkeliba Leaves.

Kinkeliba leaves used as a remedy for bilious fever of the tropics are derived from *Combretum altum* Guill. and Perr. A French missionary named Rambault, found these leaves much in use among the natives. The leaves are boiled in water and the dark red liquid drunk when the patient is suffering from a kind of bilious fever accompanied by congestion of the liver and vomiuing, and yellowness of the eyes. It is used likewise in hard attacks of the colic and also to restrain vomiting when not attending bilious fever. From the pulverized fruits and oil a salve is prepared which they apply to pus-discharging boils due in part to venereal and in part to other diseases. P. Rambault has observed that the dried leaves retain their efficiency for several years. His directions for preparation state that 4 grm. of leaves are used in 250 grm. of water, or 16 grm. per liter; the leaves allowed to boil fifteen minutes. The liquid must be bitter and brownish but not dark brown. In bilious fever 250 grm. of the decoction are drunk as soon as possible, ten minutes later 125 grm., again after ten minutes 125 grm. During this disease at least one and one-half liters of this liquid must be taken each day for four days. During the first three days, the patient should partake of no food, and on the fourth very sparingly. Further details regarding treatment are given n the original.

An analysis of these leaves by Max Schlagdenhauffer gives as chief constituents tannin (20.8 in 100 grm.) and saltpeter.

The name *Kinkeliba* is taken from the Ioso language which prevails in West Africa from Rio Nunez to Sierra Leone. The plant is a shrub growing readily near streams, never in saline regions. The trunk attains a diameter of about one decimeter, has very hard white wood and when grown is conspicuous by reason of its white bark.

[Notizblatt d. königl. bot. Gart. u. Mus. zu Berlin, No. 4. p. 151. 1896.]

The Horseradish Tree.

N. S. Rudolf writes concerning this tree, *Moringa pterygosperma.* It is native in the British East Indies, occurring as a fine forest tree on the lower slopes of the Himalayas and other mountains. This tree is one of the most beautiful of the Indian jungles. The gracefully drooping branches are covered with small leaves about an inch in length, resembling sage leaves in their external characters. The fruit consists of capsules twelve to eighteen inches in length, having a triangular section, and when ripe, a brownish-yellow color. The small, light-yellow flowers are in clusters.

All parts of the tree are used for culinary purposes and can be found in most bazars. In many parts of India, the fresh tender shoots are used as a substitute for horseradish. The flowers are fried in butter and eaten with milk by some natives.

Although of great importance in ancient Hindoo medicine, the tree is not much employed in modern medicine. The native doctors and herbalists ascribe to the various parts certain properties. The freshly expressed juice of the leaves is given as an emetic; the green leaves boiled in water and applied as a poultice are said to be useful in reducing swellings in broken limbs. The flowers are powdered with *ghee*, clarified butter, in a mortar and administered as a powerful liver tonic, increasing the flow of bile; they are regarded as a valuable remedy in treating jaundice and sluggish liver and are reported to be an efficient aphrodisiac. The root has a pungent, burning taste. When finely scraped and applied as a poultice, it is vesicant in its action. The diluted juice expressed from the fresh root when administered internally acts as a diuretic, prevents gravel and aids digestion. The fruit is used in the preparation of curry and is recommended as an article of diet in certain liver troubles. The tree exudes a quantity of clear, yellow gum from the trunk in the hot season. This swells greatly on moistening and is used as a tent in dilating the os uteri. The seeds yield a clear, light colored, fixed oil, which lacks special therapeutic properties, but is largely used in extraction of perfume from flowers.

[Bull. of Pharm. 1897, p. 343.]

Literary.

Books and Pamphlets Received.

Verlag von Julius Springer—Berlin. Neues pharmaceutisches Manual von Eugen Dieterich. Siebente, vermehrte Auflage. Ein Bd., pp. vi, 842, mit in den Text gedruckten Holzschnitten. 1897.

—— Die Arzneimittel der organischen Chemie. Für Aerzte, Apotheker und Chemiker bearbeitet von Dr. Hermann Thoms. Ein Bd, pp. vi, 157. 1897. M. 6.00.

Ancienne Librairie Germer Baillière et Cie. — Paris. Dictionnaire de Physiologie par Charles Richet, Professeur de Physiologie à la Faculté de Médecine de Paris. Troisième Fascicule du Tome II, pp. 641—976, avec 36 gravures dans le texte. 1897.

Verlag von Wilhelm Engelmann — Leipzig. Lehrbuch der allgemeinen Chemie von Dr. Wilh. Ostwald, Professor an der Universität zu Leipzig. In zwei Bänden. Zweiten Bandes zweiter Theil: Verwandtschaftslehre. Zweite Lieferung, pp. 209—416. 1897. M. 5.00.

Verlag von Gustav Fischer — Jena. Vorlesungen über Bakterien von Dr. Alfred Fischer, a. o. Professor der Botanik in Leipzig. Ein Bd., pp. VIII, 186, mit 29 Abbildungen. 1897. M. 4.00.

Smithsonian Institution — Washington, D.C. Annual Report of the Board of Regents of the Smithsonian Institution, showing the operations, expenditures, and condition of the institution to July, 1895. One vol., pp. xliii, 837.

R. Gärtner's Verlagsbuchhandlung — Berlin. Chemisch-technisches Repertorium. Uebersichtlicher Bericht über die neuesten Erfindungen, Fortschritte und Verbesserungen auf dem Gebiete der technischen und industriellen Chemie mit Hinweis auf Maschinen, Apparate und Literatur. Herausgegeben von Dr. Emil Jacobsen. 36. Jahrgang. 1897. Erstes Halbjahr. Zweite Hälfte, pp. 137—311.

Verlag von Julius Springer — Berlin. Vierteljahrsschrift über die Fortschritte auf dem Gebiete der Nahrungs- und Genussmittel, der Gebrauchsgegenstände sowie der hierher gehörenden Industriezweige. Unter Mitwirkung von zahlreichen Fachgenossen mit der Redaction beauftragt Dr. A. Hilger. Zwölfter Jahrgang. Das Jahr 1897. Zweites Heft, pp. 153—327.

U. S. Dept. of Agriculture — Washington, D.C. Contributions from the U. S. National Herbarium, Vol. V, No. 3. Studies of Mexican and Central American Plants by J. N. Rose. Brochure, pp. 109—144.

—— The Camphor tree (*Cinnamomum camphora* Nees & Eberm.). Circular No. 12, Division of Botany. Pamphlet, pp. 7.

Authors — Philadelphia. Some North American Coniferae. A series of papers reprinted from the American Journal of Pharmacy, Jan. 1896 to July 1897, by Edw. S. Bastin and Henry Trimble. Brochure, pp. 124.

Author — Baltimore. Pharmaceutic chemistry, pharmacology and pharmacophysics the natural stepping-stones to scientific medicine, by Dr. Alfred R. L. Dohme. Reprint from the Journ. Am. Med. Ass. Pamphlet, pp. 8.

Dairy and Food Commission — Madison, Wis. Laws of Wisconsin relating to the office and duties of the Dairy and Food Commissioner and the adulteration of butter, cheese, and other foods, drugs, medicines and liquors. Prepared and published under direction of H. C. Adams, Dairy and Food Commissioner. Pamphlet, pp. 32. 1897.

Reviews.

Die Arzneimittel der organischen Chemie. Für Aerzte, Apotheker und Chemiker bearbeitet von Dr. Hermann Thoms, Privatdozent* an der Universität Berlin. Zweite, vermehrte Auflage. Verlag von Julius Springer, Berlin. Ein Bd., pp. vi, 157. 1897. M. 6.00.

If we reflect what has been accomplished scientifically by way of discovery of new remedies since the appearance of the first edition of this work in 1893 the result, in spite of the numerically large increase in new remedies, is on the whole modest. The investigative thought has principally pursued old channels. The desire to secure new substitutes for iodoform by the introduction of iodine into various molecular groups is a good illustration of this fact. Phenetidine, which has been found to be therapeutically a very valuable substance, has been made the basis of numerous new compounds, mostly antipyretics and antineuralgics like the basal compound.

Whereas on the one hand it may be a matter of regret that our materia medica is growing altogether out of proportion with the needs of therapy, on the other hand it is probably well that these channels of investigation be thoroughly explored. The fittest will no doubt survive ultimately and, what will be of greater importance, the relation between physiological action and chemical constitution may some day permit of valuable generalizations on account of the detailed knowledge obtained.

Numerous attempts to prepare artificial substitutes for cocaïne have been made. A successful attempt is that of Mehrling resulting in the preparation of eucaïne. Not only does the synthesis of known alkaloids or of substances which have like or similar therapeutic properties but are by no means identical, still constitute a well-worked field of scientific investigation, but a new tendency, viz. to change natural vegetable alkaloids by oxydation, by the introduction of new radicles etc., has assumed greater importance in the more recent chapters of new remedies.

Under this captious name old remedies have been introduced largely in a modern and on the whole more scientific garb. What role organotherapy is destined to play in materia medica may not yet be ascertainable with certainty. May not these recently introduced organo-preparations soon be replaced by the isolated form of their therapeutically valuable constituents, is a question that suggests itself rather emphatically since Baumann's discovery of iodothyrin.

Such and other similar considerations, for they might be spun out almost indefinitely, certainly indicate the necessity of constantly being wide awake on the part of both physician and pharmacist. Both pharmaceutical and medical journals are compelled to give no small amount of space to the evolution and to what at times seems like revolutions of modern materia medica. Although the busy practitioner in both professions secures the latest information in this manner, he is greatly in need of a compendium to which he can refer more readily than to the files of his journals.

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* Recently appointed Professor.

Although several smaller guides through the conglomerate known as new remedies exist, there is possibly not one which is as complete and serviceable as the one before us. Though not absolutely complete, it possibly contains a larger number of primes than any similar compilation. The primes are duly emphasized by heavy type and include the synonyms, an arrangement that makes the work all the more valuable for ready reference. Besides name, synonymy and formula contained in the first column, the second contains information with regard to preparation. The third column contains an enumeration of the more practically valuable physical and chemical properties, and the fourth column contains a brief account of its therapeutic application including dose. The information contained in the last column has been submitted to a medical authority. The following illustration will at a glance show the arrangement of the text.

Acidum dijodo salicylicum. Dijod Salicylsäure. $C_6H_2I_2(OH).COOH$.	Bildet sich bei der Einwirkung von Iod und Iodsäure auf Salicylsäure in alkoholischer Lösung.	Weisses, kleinkrystallinisches, zwischen 220° und 230° unter Zersetzung schmelzendes Pulver von süsslichem, nicht ätzendem Geschmack. Löst sich in 1500 Theilen kalten, 660 Theilen heissen Wassers, leicht löslich in Alkohol und Aether. *Vorsichtig aufzubewahren!*	Als Analgeticum, Antithermicum und Antipyreticum angewendet, wie Salicylsäure. Dosis 1—3 g. pro die.

The new edition will be very welcome to those who possessed the first, which was reviewed in these columns in 1894 (p. 75). At that time a more detailed exposition of the contents of the work was given. Those who have not known the first edition and who read German will do well to make its acqaintance. The price is exceedingly reasonable and the book work is excellent. *E. K.*

Praxis der Harnanalyse. Anleitung zur chemischen Untersuchung des Harns nebst einem Anhang Analyse des Mageninhalts von Dr. Lassar-Cohn, Universitätsprofessor zu Königsberg i. Pr. Verlag von Leopold Voss, Hamburg und Leipzig. Brochure, pp. 38. 1897. M. 1.00.

Many pharmacists and physicians who have a fair chemical knowledge shrink from making some of the simple tests for constituents of normal or pathologic urine. This condition may be brought about by a lack of practice accompanied by a want of confidence or through a slight acquaintance with some of the larger works on the subject with their bewildering profusion of tests causing a test for albumen to assume the appearance of a scientific investigation. Yet any one with a fair knowledge of chemistry and of chemical analysis should be able with the aid of a guide to perform all of the tests commonly demanded for a proper diagnosis based on the constituents of urine.

The object of this little treatise is to encourage physicians, apothecaries and chemists to perform these tests without hesitancy. The price of the booklet is so cheap that every pharmacist who has the requisite chemical knowledge should secure a copy and begin to practice at once, thus preparing himself for professional work along this line. The author presupposes a knowledge of chemical technique and therefore does not go into minute descriptions of details of manipulation, neither does he produce cuts of any utensils to be used as some of our American manuals do. This readily explains why he succeeds in crowding so much necessary information into so small a treatise.

Frequently it is difficult to obtain pathologic urine with which to perform the various tests for the sake of practice. This difficulty is overcome by the preparation of artificially pathologic specimens for the various tests. The substances for which tests are described are albumen, sugar, acetone, aceto-acetic acid, coloring matters from gall and blood, urobilin, indican, sulphuric acid, simple and paired, chlorine, phosphates, ammonia. The quantitative estimation of several of these is also outlined. Lists of the necessary reagents and apparatus are appended. Persons who have not had a course of urinary analysis at college, will find this treatise very serviceable. *E. K.*

Neues pharmaceutisches Manual von Eugen Dieterich. Siebente, vermehrte Auflage. Verlag von Julius Springer, Berlin. Ein Bd., pp. VI, 842, mit in den Text gedruckten Holzschnitten. 1897.

One of the most unsatisfactory demands which, on the whole, can be made upon the pharmaceutical reviewer is the request to comment on a pharmaceutical formulary. The factor of greatest importance in the compilation of such a work is accuracy of details, moreover of details which cannot be passed upon by theoretic speculation, but by actual experiment only. A satisfactory review of a new formulary is therefore a practical impossibility if anything more than a mere statement of contents is wanted.

Although the volume before us bears the attribute "new" in connection with its title, it is by no means new. Neither is it old in the sense of antiquated but rather in the sense of tried. The fact that seven editions have thus far become a necessity is a comment in itself more favorable than much praise. The work has not only been tried and found satisfactory, the crucial test in case of a formulary, but it has also grown, apparently with every new edition. Whereas the first edition contained but 344 pages, the fifth contained 717 pages or more than again as many. This edition published in 1892 was reviewed at length in the columns of this journal (vol. 10, p. 249). The sixth edition, published in 1894 (reviewed vol. 12, p. 223), contained 740 pages. In 1896 a supplement of 70 pages to this edition was published (reviewed vol. 14, p. 71). The last or seventh edition now before us contains 842 pages, as already stated above. If to these data is added the statement that the first five editions appeared in as many years, it would seem that nothing more need be said, for a work that has had such a remarkable history needs no further introduction to those who thus far have not made its acqaintance. To those who possess one or the other of the older editions it evidently speaks for itself.

The original formulary in the course of the rapidly succeeding editions has gradually grown into what might be termed a commentary of formulary preparations. Detailed directions for pharmaceutical technique and what one in this country terms operative or practical pharmacy are included in numerous chapters on the whole richly illustrated. Whereas a good formula will remain unchanged and a formulary of tried formulas will therefore undergo modifications only in so far as new additions are concerned, the technique is constantly being improved. Here, therefore, the greatest changes may be expected and naturally are to be found, both in the way of improvements and additions. The index of forty-one triple column pages contains over eight thousand items, apparently complete and therefore very valuable.

The Neues pharmaceutisches Manual was primarily intended for the Germans whether living in Germany, Austria, America or elsewhere. Inasmuch as the strictly formulary part requires but little knowledge of the German language to be readily comprehensible, it is natural that such a work should find favor among others than those who master the German. In order to facilitate the use of this work with such persons, the author in the supplement ventured on a then new departure in publishing a list of substances mentioned and technical expressions used in the earlier editions of the work, together with their Latin, French and English translations. This glossary had to be criticized unfavorable at the time (see Review, vol. 14, p. 71), both for lack of proper discretion in the choice of the words and for exceedingly poor translations. Evidently the author did not take cognizance of this criticism, for some of the English translations are too absurd to appear uncorrected in a new edition as they all do. It is to be hoped that the author will have these lists revised by competent persons who can translate without a dictionary or if using a dictionary know which translation of several is wanted in a given case.

Fortunately these imperfections do not affect the formulary which constitutes the bulk of the work. Those who read German may never have occasion to consult the glossary and those who are compelled to do so occasionally will readily see the mistakes and not be tripped by them, for they are too apparent to those conversant with the language in question. The book work is of the usual excellence. On the whole the work has recommended itself to such an extent that any further recommendation to the pharmaceutical practitioner and manufacturer appears uncalled for.

E. K.

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FRIABILITY IS NO PROOF OF SOLUBILITY.

SPECIFY WM. R. WARNER & CO.'S

SOLUBLE COATED PILLS,

THEY HAVE STOOD THE TEST FOR FORTY YEARS.

Do not attempt to **test** the **solubility** or **insolubility** of a pill by hammering it on a pine board. What does it signify? **Simply take a glass of water 98° to 100° and suspend the pill as indicated below:**

The TRUE TEST of the solubility of a pill.

This test is demonstrative and conclusive proof of the solubility of mass pills, bearing the name of **Wm. R. Warner & Co.** because what **dissolves in plain water must dissolve in the warm visceral fluids of the body.**

FRIABILITY is no proof of **SOLUBILITY** as is evidenced by the following experiment:

Our chemist took Pil. Cathartic Comp. of Wm. R. Warner & Co.'s make (and the same of Friable Pills) and placed them in water 98° to 100°.

These are the results:—

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Dissolved in 65 minutes.

Every five minutes the pills were rolled with the finger, each getting **same amount** of rolling, or about equivalent to peristaltic action. We have proven the solubility of our mass pills. We have proven that **Mass Pills are more soluble than Friable Pills.** Try it yourself and you will reiterate our statement that

FRIABILITY is not a proof of **SOLUBILITY.**

Our pill business has been established for the past forty years, and we have never had complaints as to the inactivity of our pills. By taking a dose of Cathartic Pills and noting results is all that is necessary to prove their efficacy.

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(Formerly **Pharmaceutische Rundschau.**)

An Illustrated Monthly Journal.

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EDITORIAL.

Although the Review has fearlessly exposed shams as well as more positive evils, it has wherever possible excluded the personal element. On the one hand, little good is accomplished by personal attacks; on the other, little improvement is possible if all remain silent in the face of sham and wrong. The more we can leave our own little self out of consideration in eulogy as well as in condemnatory criticism, the better for the cause which we represent. For this reason it is also well to avoid discussions to and fro in the columns of journals. It is on the whole a cheap form of advertisement. If a subject is fairly well presented in one journal and the views are opposed in another journal, the writer, as a rule, may contently leave the whole matter to the readers of both journals. If the readers are intelligent and desirous of knowing the truth, they will have learned to discriminate.

This has been the policy of the Review, which, as a rule, it has observed. It does not intend to deviate from this policy at present, but simply state it by way of explanation of its attitude in a matter which, no doubt, has attracted the attention of some of the readers of the Review who also read the American Journal of Pharmacy. In the November number of the latter journal Professor Remington states that "a German editor in America" "found fault" with the Brussels Congress, because "from the beginning to the end not a German word was heard in the deliberations of the Congress."

The Review merely desires to call attention to the fact that it would have been rather poor taste for any German editor, whether in America or Germany, to find fault with the deliberations of the Brussels Congress for such reasons. Those persons who desire to know what the American editor of the Review did write about the Brussels Congress, can easily find out by consulting the October number of this journal.

The writer does not construe Professor Remington's criticism as a personal attack upon the editor of the Review, neither does the writer want to cast any reflections, in this matter, upon his Philadelphia colleague. The differences are evidently caused by misunderstanding. To call attention to this is all that is necessary. Differences of opinion will always exist and there is no reason why we should all agree both in religion and politics before we consent to join hands in the elevation of our profession. Even if Professor Remington and the editor of the Review are, as is but natural, influenced by their personal characteristics as to the manner in which they look at the same event, this is no reason why personalities should be indulged in on either side. As to the general views presented by Professor Remington in his article referred to above, these the writer prefers not to touch upon at present for the reasons already stated.

In its report of the Minnetonka Meeting of the American Pharmaceutical Association the Review (p. 170) called attention to the lack of proper discussion of reports and papers. There is little sense in having papers printed in advance in order to have them read at the meeting by the author, and finally to have them reprinted and buried in the Proceedings. The same papers and reprints can be read with much more comfort at home. What we sadly lack at these meetings is a liberal allottment of time for discussions.

The editor of the American Journal of Pharmacy has also raised his voice in behalf of better discussions. The value of such discussion, however meagre, is shown by a short paragraph in the Twelfth annual report of the Massachusetts Board of Registration in Pharmacy (p. 6.) In reply to one of the queries of the Section on Education and Legislation, Mr. Whitney read a paper occupying little more than a page in print. Aside from the direct reply to the query, this paper brought out the fact that a candidate had come up for examination before the Board as often as eighteen times. His first examination was in March, 1888, and "he passed" in June, 1897. Attention was called to the pedagogic crime which must tend to defeat the very purposes of the law in so far as the examination is supposed so be a test of fitness. The Board now requests that section 5 of the law, which says: "Any person may be reexamined at any regular meeting of the Board, upon the payment of a fee of three dollars," be amended. If a single remark may lead to the correction of such an abuse, what may we not expect from more liberal discussions wisely directed.

During the year from Oct. 1, 1896 to Oct. 1 of this year the Massachusetts Board has examined 540 candidates at fourteen examinations, each covering a period of two days. Of this large number 79 were registered and not less than 461 refused. These figures apparently do not speak well for the commonwealth that prides itself on having the oldest institution for higher education in the country. The fact is that Harvard has never had a place for pharmacy in its educational curriculum.

If these figures cry loud, others cry louder. Of the 79 successful candidates 14 passed on a first examination, 19 on a second, 7 on a third, 17 on a fourth, 7 on a fifth, 5 on a sixth, 2 each on a seventh, eighth, tenth and eleventh examination respectively, and one each on a twelfth and an eighteenth.

As if it were necessary to apologize for undue severity, the Board publishes a number of answers, a few of which may be quoted to show that even six and eight years of "practical experience" will not necessarily make competent druggists.

"Thorn apple is nut galls."

"Cod liver oil comes from the whale and sweet oil from the hog."

"Hirudo means a large pill or suppository."

"Aloes are obtained by cutting down the trees and pruning them."

"Aloes are the inside fruit of a nut."

An applicant who had been refused six times says on his seventh examination: "Ejusdem means, let him take"; correcting himself he said: "It means a rectal injection."

An applicant claiming eight years' experience, age twenty-one, says: "A tablespoonful of laudanum contains half a grain of opium...... Opium is obtained by insects pinching the buds of opium trees."

The Massachusetts Board has done excellent work in weeding out the dram shops, those saloons of would-be respectable people and we should be glad to see it set an example to other states in the near future as to the proper way of conducting examinations. But as long as there is one drug store to every fifteen hundred inhabitants, there is reason to fear that the better educated young men of the Bay State will prefer to enter other callings than that of pharmacy.

The Proceedings of the nineteenth annual meeting of the Missouri Pharmaceutical Association contain an unusual amount of food for reflection. This state association has been more or less prominent among its sister associations, especially in the central west. Some of its friends claim for it the honor of having introduced progressive methods of conducting annual meetings. It is, therefore, with special interest that pharmacists from other states watch the tendencies developed in the Bourbon state by the "Missouri idea," if a quotation from the National Druggist be permitted.

Missouri pharmacists have claimed and many pharmacists from other states, who have fallen in line with the advocates of the "Missouri idea," have claimed again and again that the sports indulged in so largely by many state associations at their annual meetings, bring out more members; that the scientific workers of an association get a larger audience on account of this bait and are therefore greatly stimulated in their investigations.

Those who were so dull as not to be able to understand this kind of logic will, no doubt, become even more so, if they read the "emphatic" plea of the late President of the Missouri Association. Some of his words are worth quoting. He says: "We boast of the largest association in this country, and while our attendance is always large, the attendance at the business meetings in the past two or three years has been very slim and discouraging to the officers of the association. You discourage the very things for which pharmaceutical associations are formed—for the advancement of pharmacy and for our mutual improvement and benefit." Later he indicates where the trouble lies: "I would not for one moment disparage any of the outdoor sports. There is time for all—all we ask of you is about four hours during the day, two in the morning and two in the afternoon, and I beg of you all to come out and be here on time."

These words embody a sad confession coming from the president of the association that boasts of being the parent of the new idea that almost captured the "last stronghold," the American Pharmaceutical Association, this summer.

Two years ago when the writer, having the Sheboygan meeting of the Wisconsin Pharmaceutical Association particularly in mind, characterized some of the doings of the state associations, he was severely criticized by a number of St. Louis pharmacists. The shoe evidently fitted the Missouri Association as well as the Wisconsin Association. The writer should be greatly pleased to have some of the Missouri friends witness the "outdoor sports" such as were conducted at Green Bay last summer. The tune "There 'll be a hot time in the old town to-night" was never more appropriately played unceasingly for several hours than on a memorable August night in this historic town. Such a spectacle the city evidently had never before witnessed. If some of the zealous Jesuit fathers could have risen from their graves, they might have been tempted to give up their missionary work among the red men and to take up "home" missionary work.

What benefit are we deriving from this "Triumph of the Missouri Idea"? In the very home of this "Idea" we find that its tendencies are "emphatically" criticized. That the President's views are shared by others is shown by the report of the Committee on the President's Address: "We are sorry to be obliged to agree with the President in his criticism of the lack of interest in business and scientific meetings." According to the Secretary's report, the Proceedings of the two previous years could not be printed until a month previous to this year's meeting, because not sufficient money was on hand to pay the printer's bill. According to a St. Louis professor, Wisconsin has "outdone Missouri." Be it remembered in this connection that Wisconsin was represented at the Minnetonka meeting of the American Pharmaceutical Association by two members and that a third was admitted to membership after he had left.

But the fame of the "Missouri Idea" has been carried farther. A Canadian member of the American Association expressed his undisguised disgust at the way in which the Wisconsin Association and others conduct their annual meetings. The Chemist and Druggist of London contained in a comparatively recent number a sketch of our state association meetings that certainly roused much mirth on the part of our British cousins. According to the Pharmaceutical Journal, another London weekly, Professor Remington entertained his British hosts at the Smoking Concert at Glasgow by giving "a brief and humorous account of a pharmaceutical meeting at which he was present in the wild and woolly west." The reporter then states that, "like most of his countrymen, Professor Remington is a humorist, and his well-told account of the gathering and the amusing incidents that occurred kept the audience in a constant state of laughter. His account of the man who won the old man's race by sticking out his goatee or beard just at the finish was immense, as was the judge's decision of 'won by a hair'."

The reputation that we are gaining at home and abroad certainly cannot be considered enviable. If the pharmacists in America are in danger of being blinded by the eulogies of pretending friends, their eyes certainly ought to be opened by accounts such as the above. The true friend will not shirk from stating the naked truth if need be, even if it is as unpleasant to say it as it is to listen to it.

The writer is by no means fond of midnight scientific sessions. One of the greatest benefits to be derived from the meetings of associations of any kind is the personal intercourse between men of like calling. The social features are, therefore, gaining ground in all scientific associations. But there are no scientific associations, either on this side of the Atlantic or on the other, that conduct themselves in the manner of many of our state pharmaceutical associations. The "outdoor sports" bring out the "boys," but the men largely stay at home.

In this connection it may be of interest to note what efforts are necessary to bring out 160 druggists and ladies. The Secretary's report gives us an insight. He reports:

> "An unusual effort has been made to keep the meeting prominent in the minds of the members. About six weeks ago the Secretary sent a notice of the meeting for publication in each pharmaceutical journal. The Local Secretary, Mr. Thomas Layton of St. Louis, mailed a postal card to each member of the Association about ten days later. This was followed in a week by the official circular of the Permanent Secretary. The Meramec Highlands Company next addressed the members. Then came a neat announcement of the meeting from the Crescent Paint and Color Company of St. Louis. Mr. Geo. E. Hopkins, Chairman of the Transportation Committee, sent a circular of information to the members, and on Saturday last the Meyer Brothers Drug Company mailed them a special letter. Perhaps other firms have taken similar action."

Seven invitations to bring together a small fraction of the druggists of a state, or of the metropolis of a state, at a summer resort a few miles from the metropolis. It would appear that Uncle Sam had the best of the bargain. Incidentally it may be of interest to note that the Pharmaceutical Travelers' Association of the same state, which met at the same place and at the same time, registered an attendance of eighty, half as many as the druggists including wives and daughters.

ORIGINAL CONTRIBUTIONS.

Medicinal Plants of Brazil.*

By *Dr. Theodor Peckolt of Rio de Janeiro.*

Nectandra amara Meissn. Diese Art kommt vor vom Staate Pernambuco südlich und westlich bis zum Staate S. Paulo. Hier im Staate Rio de Janeiro befindet sich dieselbe vorzugsweise auf dem Orgelgebirge und dessen Ausläufern. In diesem Staate und S. Paulo heisst dieselbe *Canella preta* —schwarzer Zimmt: in Minas: *Paó de Santa Anna;* in den anderen Staaten: *Louro preto* — schwarzer Lorbeer, *Louro amargoso* — bitterer Lorbeer; der Tupiname ist *Lurinée.*

Ein schöner, 10 bis 14 Meter hoher Baum mit weit ausgebreiteter Krone. Die jungen Zweige und Knospen sind braungelb befilzt. Die Blätter sind lancettlich, etwas zugespitzt, an der Basis verschmälert, die Ränder zurückgerollt. Der Blüthenstand besteht aus achsel- und endständigen, doldenförmigen Rispen mit weissen, wohlriechenden Blüthen. Die Beere ist oval, von der Grösse einer kleinen Olive, bis zu ⅔ vom Becher umschlossen. Das Holz ist schwarzbräunlich, an der Luft dunkler werdend und als Möbelholz noch mehr geschätzt und höher bezahlt als das Holz von *Nectandra mollis.*

Die Rinde ist nicht allein ein vielfach benutztes Volksheilmittel, sondern auch als *Nectandra amara* officinell und von den Aerzten häufig verschrieben. Ich kann die Wirksamkeit bestätigen. Dieselbe verdient auch in anderen amerikanischen und europäischen Ländern therapeutisch benutzt zu werden.

Die Rinde der im Staate S. Paulo wachsenden Varietät *australis* wird vorzugsweise benutzt. Diese wurde auch untersucht. Dieselbe wird von den Sammlern in 5 bis 8 cm. breiten Streifen vom Stamme und den dicken Aesten abgelöst, dann in Stücke von verschiedener Länge geschnitten. Getrocknet bilden diese dann ziemlich flache, 4 bis 5 mm. dicke Stücke, welche aussen graubraun, warzig höckerig, stellenweise mit einer weissen Flechte bekleidet sind. Im Durchschnitt sind sie röthlichbraun. Die Innenfläche ist matt röthlich-braun. Sie sind schwer spaltbar, im Querbruch sehr faserig. Gestossen liefern sie ein hell röthlichbraunes Pulver. Die frische Rinde hat einen schwachen, doch angenehm aromatischen, etwas Pichurim ähnlichen Geruch. Gekaut ist sie von styptisch, bitterem Geschmack. Bei der getrockneten Rinde ist der Geruch schwächer und der bittere Geschmack kaum bemerkbar styptisch.

Im Staate S. Paulo ist die gepulverte Rinde unter der Benennung *Pos de Santa Anna* ein Specificum bei chronischer Diarrhoe und atonischer Dyspepsie. Dreimal täglich wird ein halber Theelöffel voll mit Wasser genommen. Die Aerzte verordnen, ausser bei den genannten Affectionen, noch bei intestinal Catarrh, Enteritis, Cantarrhalis, Disenterie, Lienterie.

Von der Tinctur (1:5 Alcohol) wird Kindern 2 bis 4 Tropfen, Erwachsenen 2 bis 5 Grm. dreistündlich verabreicht. Das Decoct, 30 Grm. zu 300

Nectandra amara Meissn. This species occurs from the state Pernambuco southward and westward to the state S. Paulo. Here in the state Rio de Janeiro it is found especially in the Organ Mts. and in the outlying ranges. In this state and S. Paulo it is called *Canella preta* — black cinnamon; in Minas: *Paó de Santa Anna;* in the other states: *Louro preto* — black laurel, *Louro amargoso* — bitter laurel; the Tupi name is *Lurinée.*

A fine tree from 10 to 14 meters high with a widely spreading crown of branches. The young branches and buds are brownish-yellow, pubescent. The leaves are lanceolate, somewhat acuminate, narrowed at the base, the margin reflexed. The inflorescence consists of axillary and terminal, umbellate panicles of white, fragrant flowers. The berry is oval, in size equal to a small olive, two-thirds enclosed by the cupule. The wood is brownish-black, turning darker on exposure to the air. For furniture this wood is more highly prized and commands a higher price than that of *Nectandra mollis.*

The bark is not only a much-used popular remedy, but also, like *Nectandra amara,* is official and is frequently prescribed by physicians. I can affirm the activity ascribed to this. It deserves to be used therapeutically in other American and European countries.

The bark of the variety *australis* found in the state S. Paulo is used chiefly. This was also investigated. It is peeled from the stems and large branches by collectors in strips 5 to 8 cm. wide, which are then cut into various lengths. When dried, these form rather flat pieces, 5 mm. thick, which externally are grayish-brown, with warty projections, clothed in places with a white lichen. In cross sections they are reddish-brown. The inner surface is dull reddish-brown. They are split with difficulty, fracture very fibrous. When ground, they yield a light, reddish-brown powder. The fresh bark has a faint, but pleasant, aromatic odor, somewhat like pichurim. When chewed it has a styptic, bitter odor. In the powdered bark, the odor is fainter and the bitter taste hardly noticeably styptic.

In the state S. Paulo the powdered bark under the name *Pos de Santa Anna* is a specific for chronic diarrhœa and atonic dyspepsia. A half-teaspoonful is taken with water three times daily. In addition to the troubles named, the following affections are treated by physicians with this remedy: intestinal catarrh, enteritis, dysentery, *cantarrhalis* and lientery.

Two to four drops of the tincture (1:5 alcohol) is the dose for children, for adults two to five grams every three hours. The decoction, 30 grm.

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* Continued from p. 155. Translated for the Review by Dr. R. H. True, Asst. Prof. of Pharmacognosy at the University of Wisconsin.

Grm. Colatur, wird kelchweise zwei- bis dreistündlich, das spirituöse Extract, in der Dosis von 0.05 bis 0.2 Grm. steigend, drei- bis viermal täglich genommen.

Die frische sowie die lufttrockene Rinde wurde untersucht. 50 Ko. der gestossenen frischen Rinde liefern bei der Destillation mit Wasser 20.8 Grm. ätherisches Oel. Dasselbe ist gelblich, von brennendem Geschmack, angenehm aromatischem Geruch, ähnlich dem einer Mischung von Sassafrass und Pichurim. Das sp. Gew. ist 0.960 bei 17° C.

Die lufttrockene Rinde verliert 12.9 p. c. Wasser und hinterlässt 1.92 p. c. Asche. Dieselbe liefert 20 p. c. spirituöses Extract. Dasselbe wurde in säurehaltigem Wasser gelöst, die vom Harz befreite Lösung zur Syrupconsistenz eingedämpft, alkalisch gemacht und mit Aether ausgeschüttelt. Die ätherische Lösung wurde verdunstet und nach zweimaliger Lösung und Ausschüttelung wurden 0.079 p. c. eines farblosen, amorphscheinenden Pulvers erhalten. Unter dem Mikroskop jedoch erwies es sich als krystallinisch. Es ist geruchlos, anfänglich geschmacklos, dann von stark bitterem Geschmack. Auf Platinblech erhitzt schmilzt es und erstarrt wieder beim Erkalten zu einer krystallinischen Masse. Weiter erhitzt verflüchtigt es sich vollständig. In Wasser ist es so gut wie unlöslich. Es ist jedoch löslich in angesäuertem Wasser, Aether und Alcohol. Die alcoholische Lösung reagirt alkalisch. Die Lösung gibt Präcipitate mit Mayers's Reagens, Sublimat und Goldchlorid.

Die wässerige Lösung des spirituösen Extractes wurde mit neutralem und dann mit basischem Bleiacetat gefällt und die von den Präcipitaten befreite Flüssigkeit von Blei befreit und zur dünnen Extractconsistenz abgedampft. Dieses Extract wurde mit absolutem Alcohol behandelt so lange sich derselbe noch färbte. Die alcoholische Lösung wurde durch Destillation zur Syrupconsistenz concentrirt und der Rückstand wiederholt mit Aether ausgeschüttelt. Der unlösliche Theil enthielt noch eine harzartige Substanz, wovon derselbe durch Behandlung mit Chloroform befreit wurde. Durch wiederholtes Lösen in absolutem Alcohol und Verdunsten über Chlorcalcium wurden 1.25 p. c. einer Masse erhalten, welche beim Verreiben ein hellbräunliches, geruchloses Pulver von bitterem Geschmack ergab. Dieser *Nectandra* Bitterstoff hinterliess beim Verbrennen auf Platinblech nur eine geringe Spur Asche. Es löst sich in Alcohol und Wasser. Die Lösung reagirt neutral. Mit Tanninlösung, Mayer's Reagens, Sublimat und Goldchloridlösungen giebt dieselben Niederschläge.

Aus dem Präcipitat des neutralen Bleiacetates wird 1.6 p. c. Gerbsäure erhalten. Getrocknet und gepulvert ist dieselbe hellröthlich, geruchlos und von stark styptischem Geschmack. Dieselbe ist in Alcohol und Wasser löslich. Eisenchlorid färbt die Lösung schwarz, Barytwasser verursacht einen bräunlichrothen, Kalkwasser einen hellbräunlichen Niederschlag. Kaliumchromat verursacht eine dunkelrothbraune Färbung, dann ein Gelatiniren der Lösung. Brechweinstein, Chininsulfat und Leimlösungen verursachen ebenfalls Niederschläge.

Aus dem durch basisch essigsaures Blei hervorgebrachten Niederschlag wird durch Lösung in absolutem Alcohol ein amorpher blutrother Farbstoff, 0.255 p. c., erhalten. Derselbe ist löslich in Alcohol und Wasser. Eisenchlorid verursacht eine rothbraune Färbung, Barytwasser ein rothes, Zinnchlorid ein carminrothes Präcipitat.

to 300 grm. of colature, is given a wineglassful every two to three hours; the alcoholic extract in a dose of from 0.05 to 0.2 grm. in increasing doses is given three to four times daily.

The fresh as well as the air-dried bark was investigated. 50 kilos of the powdered fresh bark furnished on distillation with water 20.8 grm. of ethereal oil. It is yellowish, of burning taste, agreeable, aromatic odor similar to a mixture of sassafras and pichurim. The sp. gr. at 17° C. is 0.960.

The air dried bark loses 12.9 percent of water and leaves 1.92 percent of ash. It yields 20 p. c. of spirituous extract. The same was dissolved in acidulated water, the solution freed from resin, evaporated to the consistency of syrup, made alkaline and shaken out with ether. The ethereal solution was evaporated off and after being twice dissolved and shaken out, 0.079 percent of a colorless, apparently amorphous powder remained. Under the microscope, however, it proved to be crystalline. It is odorless, at first tasteless, then with a strongly bitter taste. Heated on platinum foil it melts and solidifies again on cooling to a crystalline mass. Heated further it volatilizes completely. In water it is as good as insoluble. It dissolves, however, in acidulated water, ether and alcohol. The alcoholic solution reacts alkaline. The solution gives precipitates with Mayer's reagent, sublimates and gold chloride.

The aqueous solution of the alcoholic extract was precipitated with neutral and then with basic lead acetate and the liquid, freed from the precipitates, freed from lead and evaporated to the consistency of a thin extract. This extract was treated with absolute alcohol as long as it was still colored. The alcoholic solution was concentrated to a syrupy consistency by distillation and the residue repeatedly shaken out with ether. The insoluble part contained still a resinous substance of which it was freed by treatment with chloroform. By repeated solution in absolute alcohol and evaporation over calcium chloride, 1.25 p. c. of a mass was obtained which on pulverization gave a light brownish, odorless powder of bitter taste. This bitter principle of *Nectandra* on incineration on platinum foil left only a slight trace of ash. It dissolves in water and alcohol. The solution reacts neutral. With tannin solution, Mayer's reagent, sublimate and gold chloride solution, it gives precipitates.

From the precipitate of lead acetate, 1.6 p. c. of tannic acid was obtained. When dried and powdered, it is bright reddish, odorless and with a strongly styptic taste. It is soluble in alcohol and water. Iron chloride colors the solution black, baryta water gives a reddish-brown precipitate, lime water one light brownish. Potassium chromate causes a dark reddish-brown turbidity, then the gelatinizing of the solution. Tartar emetic, quinine sulphate and gelatine solutions give likewise precipitates.

From the precipitate obtained with basic lead acetate, an amorphous blood-red coloring matter, 0.255 percent, is obtained by dissolving in absolute alcohol. It is soluble in alcohol and water. Iron chloride calls forth a reddish-brown turbidity, baryta water a red, zinc chloride a carmine-red precipitate.

(To be continued.)

Popular Scandinavian Names of Drugs and Medicines.*

By *Harold Bruun.*

Kali, dobbelt vinsurt,	Potassium bitartrate.
" vinsurt,	" tartrate.
Kamille blomster,	Chamomile flowers.
" olje,	Oil of chamomile.
" the,	Chamomile flowers.
" romersk,	Roman chamomile.
Kamphor,	Camphor.
" draaber,	*Spiritus aetheris camphoratus.*
" olje,	Camphorated oil.
" " hvid,	*Linimentum camphoræ.*
" salve,	Camphor ointment.
" spiritus,	Spirits of camphor.
" vand,	Camphor water.
Kanel,	Cinnamon.
" olje,	Oil of cinnamon.
" vand,	Cinnamon water.
" draaber,	Tincture of cinnamon.
" " sure,	Aromatic sulphuric acid.
Karve,	Caraway seed.
" olje,	Oil of caraway.
" " romersk,	Oil of cumin.
Kardemom,	Cardamom.
" tinctur,	Tincture of cardamom.
Kaskarillebark,	Cascarilla bark.
Kassia laxer,	Purging cassia.
Kastanie,	Chestnut.
" blade,	Chestnut leaves.
" Heste-,	Horse chestnut.
Katechu,	Catechu.
Kathartensyre,	Cathartic acid.
Katost,	Marsh mallow.
Kattemynte,	Catnip.
Kautchuk,	Rubber.
Kermes,	Kermes mineral.
Kinoharpix,	Kino.
Kirsebaerbark, vild,	Wild cherry bark.
" sirup,	Syrup of wild cherry.
Kirselaurbaerblade,	Cherrylaurel leaves.
Kjelderhalsblast,	Mezereon bark.
" bark,	" "
Kjerner, Fiske-,	Fish berries.
Kjerner, Kvaede,	Quince seed.
Kjökkensalt,	Sodium chloride.
" soda,	Sodium bicarbonate.
Kjölende Salve,	Lead cerate.
" Pulver,	*Pulvis refrigerans.*
Klorkalcium,	Calcium chloride.
Klorkalium,	Potassium chloride.
Klorammonium,	Ammonium chloride.
Klorkalk,	Chlorinated lime.
Klornatron,	Sodium chloride.
Klorzink,	Zinc chloride.
Klovfedt,	Neatsfoot oil.
Knusk,	Punk.
Kobber,	Copper.
" vitriol,	Sulfate of copper.
Koblomme,	Cowslip.
Kochleare,	Scurvy grass.
Kongesalve,	*Unguentum basilicum nigr.*
Kokamilleblomster,	May weed.
Kokosnöd,	Cocoanut.
Kokosnöd olje,	Cocoanut oil.
Kokablade,	Coca leaves.
Kollodium,	Collodion.
" elastisk,	Flexible collodion.
" Spanskflue,	Cantharidal collodion.
Kolophon,	Resin.
Koloqvinter,	Bitter apple.
Kolumborod,	Columbo root.
Kommenfrö,	Cumin seed.
" olje romerk,	Oil of cumin.
Kommen, romersk,	Cumin.
Kongevand,	Aqua regiæ.
Korbindikblade,	Blessed thistle.
Koriander,	Coriander.
" olje,	Oil of coriander.
Kornvalmue,	Red poppy.
Korsbaer sirup,	Syrup of buckthorn bark.
" (torn)saft,	Juice of buckthorn.
Kosso,	Kooso.
Kongechinabark,	Calisaya bark.
Kongelysblomster,	Mullein.
Koppesalve,	*Unguentum stibiatum.*
Kraftmel,	Starch.
Krageome,	Nux Vomica.
Krampedraaber,	*Liquor antispasticus.*
Krandsvine,	Nux Vomica.
Krap,	Madder.
Kreosot,	Creosote.
Kridt,	Chalk.
Krotonolje,	Croton oil.
Kryddernelliker,	Cloves.
" olje,	Oil of cloves.
Krusemynte,	Curled mint.
" olje,	Oil of curled mint.
Kubeber,	Cubebs.
Kul, praepareret,	Charcoal, prepared.
Kulsurt Ammoniak,	Ammonium carbonate.
" Barium,	Barium carbonate.
" Jernoxydul,	Subcarbonate of iron.
" Kalcium,	Calcium carbonate.
" Kali,	Potassium carbonate.
" Kalioplösning,	Solution of potassium carbonate.
" Lithium,	Lithium carbonate.
" Natron,	Sodium carbonate.
" Magnesia,	Magnesium carbonate.
Kyndel,	Summer savory.
Kviksölv,	Mercury.
" renset,	" purified.
" sublimat,	Corrosive sublimate.
" Chlor,sublimeret,	Calomel.
" Jod, grön,	Green iodide of mercury.
" oxyde, gult,	Yellow oxide of mercury.
Kvadekjerner,	Quince seed.
Lakritsrod,	Licorice root.
Lakrits,	Extract of licorice, crude.
Lapis infernalis,	Silver nitrate.
Laurbaerblade,	Laurel leaves.
Laurbaerolje,	Oil of laurel.
Laudanum,	*Vinum opii crocatum.*
Lavendelblomster,	Lavender.
" olje,	Oil of lavender.
" " almindelig,	Oil of spike.
Laxer-kassia,	Purging cassia.
Lerkesvamp,	Purging agaric.
Levertran,	Cod liver oil.
Leverurt,	Liverwort.
Liguster,	Privet.
Liljekonval,	Lily of the valley.
Lindeblomster,	Linden flowers.
Lithium, citronsurt,	Lithium citrate.
" kulsurt,	" carbonate.

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[*] Copyrighted. Continued from p. 222.

Livstrae,	Thuja.
Lobelia-eddike,	Vinegar of lobelia.
Linfrö,	Linseed.
“ olje,	Linseed oil.
“ mel,	Linseed meal.
Liqv. cornu cervi,	*Liquor supercarbonatis ammoniaci pyrooleosi.*
Liqv. nervinus,	*Spirit. aetheris camphoratus.*
Loppefrö,	*Semen psylii.*
Lungeurt,	Lungwort.
Lusefrö,	Sabadilla seed.
Lusesalve,	Mercurial ointment.
Lybstykke,	Livstick.
Laebe pomade,	Lip pomade.
Laerketraebark,	Larch bark.
Lög,	Onions.
“ draaber	Ir asafetida.
Magnesia, braendt,	Magnesia.
“ citronsurt,	Magnesium citrate.
“ hvid,	“ carbonate.
“ kulsurt, let,	“ carbonate.
“ svovlsurt,	“ sulphate.
Magnetjern,	Magnetic oxide of iron.
Malurt,	Wormwood.
“ tinctur,	Tincture of wormwood.
“ Strand,	Levant worm seed.
Malva,	Malva.
Manconabark,	Sassy bark.
Mandelolje, bitter,	Oil of bitter almonds.
“ söde,	Oil of sweet almonds.
Mandelvand,	Almond water.
“ mel,	Almond meal.
Mandler, söde,	Sweet almonds.
Manganhyperoxyd,	Peroxide of manganese.
Manganoxydul,svovlsurt,	Manganese sulphate.
Mangostanebark,	Mangosteen.
Maticoblade,	Matico leaves.
Mavedraaber,	Stomach drops.
Medicintran,	Cod liver oil.
Melbaerblade,	Uva Ursi.
Melk,	Milk.
Melkesukker,	Sugar of milk.
Melkesurt Jernoxydul,	Lactate of iron.
Melotenurt,	Melilot.
Melotenplaster,	Melilot plaster.
Meldröie,	Ergot.
Merian,	Sweet majoram.
“ olje,	Oil of origanum.
“ vild,	Wild majoram.
Mesterrod,	Masterwort.
Methylaether,	Methyl ether.
Mineralvande,	Mineral waters.
Mistel,	Mistletoe.
Moder draaber,	*Tinctura antihysterica.*
“ extract,	*Species ad longam vitam.*
“ korn,	Ergot.
Modgift mod Arsenik,	Antidote for arsenic.
Monobromkampher,	Monobromate of camphor.
Morbaer,	Mulberry.
Morgenfrue,	Marigold.
Morphin, eddikesurt,	Morphine acetate.
“ saltsurt,	Morphine hydrochloride.
“ svovlsurt,	Morphine sulphate.
Mos, islandsk,	Iceland moss.
“ karagen,	Irish moss.
Musennabark,	Musenna.
Muskatblomme,	Mace.
“ olje,	Oil of mace.
“ nödder,	Nutmeg.
Muskatbalsam,	Oil of nutmeg.

Myresyre,	Formic acid.
Myrt,	Myrtle.
Mixtur, sur,	*Mixtura acida.*
Mavesaft,	Gastric juice.
Nafta,	Ether.
“ vitriol,	Sulphuric ether.
Natron, arseniksurt,	Sodium arsenate.
“ baldriansurt,	“ valerianate.
“ borsurt,	“ borate.
“ dobbelt kulsurt,	“ bicarbonate.
“ eddikesurt,	“ acetate.
“ kulsurt,	“ carbonate.
“ phenylsurt,	“ carbolate.
“ phenylsvovlsurt,	“ sulphocarbolate.
“ salpetersurt,	“ nitrate.
“ svovlsurt,	“ sulphate.
“ phosphorsurt,	“ phosphate.
“ underphosphorsyrligt,	“ hypophosphite.
“ undersvovlsyrligt,	“ hyposulphite.
“ aets,	Caustic soda.
Natskygge,	Belladonna root.
Neldebraende, Nesle,	Nettle.
Nellik,	Cloves.
“ olje,	Oil of cloves.
Nellikrod,	Water avens.
Nervedraaber,	Camphorated spirits of ether.
Nitrum,	Potassium nitrate.
Nödklovfedt,	Neatsfoot oil.
Nyserod, grön,	American hellebore.
“ hvid,	White hellebore.
“ sort,	Black hellebore.
Olje,	Oil.
“ Amerikansk,	Castor oil.
“ Anis,	Oil of anise.
“ Baldrian,	Oil of valerian.
“ Bom-,	Olive oil.
“ Citron,	Oil of lemon.
“ Dil,	Oil of dill.
“ Dippels,	Animal oil.
“ Enebaer,	Oil of juniper.
“ Fennekel,	Oil of fennel.
“ Hestemynte,	Oil of horsemint.
“ Humle, spansk,	Oil of origanum.
“ Hörfrö,	Linseed oil.
“ Kamille, romersk,	Oil of chamomile.
“ Kamphor,	Camphorated oil.
“ “ hvid,	Camphor liniment.
“ Kanel, ceylonsk,	Oil of cinnamon.
“ “ indisk,	Oil of cassia.
“ Kokosnöd,	Cocoanut oil.
“ Kommen,	Oil of caraway.
“ “ romersk,	Oil of cumin.
“ Koriander,	Oil of coriander.
“ Kroton,	Croton oil.
“ Kubeber,	Oil of cubeb.
“ Laurbaer,	Oil of bay.
“ Lavendel,	Oil of lavender.
“ “ almindelig,	Oil of spike.
“ Mandel, bitter,	Oil of bitter almonds.
“ “ söd,	Oil of sweet almonds.
“ Merian,	Oil of origanum.
“ Muskatblomme,	Oil of nutmeg.
“ Nellik,	Oil of cloves.
“ Ormefrö, amerikansk,	Oil of American wormseed.
“ Pebermynte,	Oil of peppermint.
“ Peber, spansk,	Oil of capsicum.
“ Rav,	Oil of amber.
“ Reinfan,	Oil of tansy.

(To be continued.)

Early Phases in the Development of Pharmaceutical Legislation in Wisconsin.*

By *Edward Kremers.*

One might suppose that with the presentation of the petition to the Common Council all interest in the subject would have abated for the time being, leaving matters to take their slow legislative course. Not so, however.

A Quack: Etching from Grimmelshausen's Simplicismus. Nuernberg, 1685.

(From Peters: Aus pharm. Vorzeit II, p. 243.)

Evidently with the intention of bringing about a better understanding of the entire question, which must have been rather incomprehensible to many, and with the object of furthering a good cause the "Herold" discussed the subject semi-editorially in its Sunday edition, the "Volks-Magazin", in an article entitled "On the scientific education of the pharmacist." [*Document 15.*] Attention is called to the fact that in Europe (Germany evidently is meant), the cradle of scientific pharmacy, the pharmacist must be an educated man. Furthermore that the state is very strict in holding the apothecary to the legal requirements regulating the practice of his profession and that to insure good service the apothecary shops are inspected by government officials.

The writer calls attention to the fact that there are in this country a number of druggists who have obtained a thorough training in Europe, also that on the other hand we have many who "play" with the lives of their fellow citizens. He then comments favorably on the attempt on the part of the Milwaukee druggists to improve the situation, calling for a general support.

Finally the writer points to the need of some knowledge of Latin on the part of the druggists and directs attention to an advertisement of Mr. Paul Brunnquell [*Document 16.*] who expresses his willingness to teach Latin should a sufficient number of students apply.

The same number of the "Volks-Magazin" also contains a communication by Mr. O. A. Thiele [*Document 17.*]. The writer of the communication tries to defend the secretary of the meeting held on the 13th against the anonymous writer of the "Seebote" of the 17. He then calls attenton to the fact that in the apparent simplicity of the modern druggist's duties lies a grave danger. The very fact that he can purchase almost everything ready-made from the manufacturer is a menace in itself if the druggist is ignorant or unscrupulous or both. Every druggist should be able to at least examine the drugs and chemicals used in the compounding of prescriptions. So much at least should by demanded by law for the safety of the public. Attention is called to the fact that New York has a law of this kind which has been productive of some good. The "Seebote was requested to copy this communication and complied with the request on the following day, adding, however, an editorial note [*Document 18.*] in which the editor disclaims the responsibility of correcting communications with reference to their style before publishing them gratis. Mr. Roemheld's own defense was communicated to the "Banner"? [*Document 19.*]

To the semi-editorial in the Sunday "Herold" and the communication by Mr. Thiele the anonymous writer of the "Seebote" (Sept. 17.) took exception in a second communication to the same paper on the following day. [*Document 20.*] He calls attention to the fact, that it is necessary to measure by American, not by European standards. The U. S. Pharmacopœia and its commentaries are published in the English language, hence a knowledge of Latin is not necessary on the part of the pharmacist to be able to read his "bible". As to nomenclature a knowledge of Greek would be equally desirable with Latin. A knowledge of the classics on the part of the American youth would be highly desirable, but is not absolutely necessary for the practice of pharmacy. The pharmacist is but a servant ("Famulus") of the physician and most American physicians practice their profession without a knowledge of Latin. Physicians should be accused of criminal negligence for writing unintelligible prescriptions and all druggists should decline to fill such prescriptions which is mere guesswork.

The writer is further of the opinion that if the factories are so great an element of danger as depicted it were better to place the factories under governmental control than the drug stores. He concludes with an appreciatory remark on the desire to improve ones calling, but desires that no injustice be done and that all Milwaukee druggists who have a good name join the movement.

This communication brought forth a reply on the part of the writer of the "Volks-Magazin," entitled "More about the education of pharmacists and the Latin language." [*Document 21.*] The author dwells at length on the educational value of the Latin language and criticizes some of the statements of the "Seebote" correspondent. The latter replies to the two installments contained in the Sunday and Monday numbers of the "Herold" by sending two communications to the Monday and Tuesday numbers respectively of the "Seebote" [*Document 22*]. These communications are by no means devoid of interest, inasmuch as they give vivid expression to the intensity of feeling at that time. The sum and substance of the articles of the "Herold" correspondent is that some knowledge of Latin is requisite in the education of the pharmacist, whereas the other denies the absolute necessity of such knowledge, at least as far as the American pharmacist is concerned. If two indications in the articles of the "Seebote" correspondent are worth their face value, it would seem probable that Mr. Brunnquell, who advertised a Latin school for prospective pharmacists in the "Wegweiser" (see Document 16), was the correspondent for the "Herold."

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* Continued from p. 225.

With this the controversy seems to have ended and the excitement abated, at least for the time being. Yet the further course of pharmaceutical legislation in Milwaukee was not altogether uneventful.

Document 15.

[*Volks-Magazin, Sonntags-Ausgabe des "Herold"*, Sept. 19, 1875. (p. 413, col. 1.)]

Die wissenschaftliche Bildung des Pharmaceuten.

Dass der Pharmaceut ein wissenschaftlich gebildeter Mann sein muss, dass er eingehende Kenntnisse in Chemie, Physik, Botanik und anderen Disciplinen besitze, versteht sich in dem alten Europa, der Wiege und Schule wissenschaftlicher Pharmacie, von selbst. Staat und Publikum wachen dort mit strengen Augen darüber, dass nur Solche, welche in Theorie und Praxis den unerlässlichen Anforderungen an einen zuverlässigen Apotheker entsprechen, zu der verantwortlichen Stellung eines Apotheken-Besitzers oder dessen Stellvertreters, des Provisors, zugelassen werden. Die Fürsorge des Staates erstreckt sich sogar so weit, das von seiner Seite aus regelmässige Inspectionen bezüglich der Güte der in der Apotheke vorhandenen Waaren, bezüglich des Vorhandenseins oder des strenge bestraften Fehlens wichtiger Droguen vorgenommen werden.

Der Staat verlangt ferner, dass stets entweder der Apotheker selbst oder sein vom Staate geprüfter Stellvertreter anwesend sei, er leidet nicht, dass ein noch Lernender, ohne gehörige Aufsicht Medikamente bereite, oder solche verabfolge. Und das mit vollem Rechte! Oder sollte es auch Unmündigkeit des Staatsbürgers, unberechtigter Eingriff des Staates in die individuelle Freiheit heissen, wenn das Gemeinwesen über das körperliche Wohl und das Leben seiner Angehörigen wacht? Wir haben hierzulande eine Menge auf oben erwähnte Weise in Europa, vor Allem in Deutschland, ausgebildeter Pharmaceuten, wie ferner eine grosse Anzahl Solcher, welche unter Anleitung derart erprobter Meister in ihrem Fache, in Amerika ihrem Berufe Ehre machen lernten. Wir haben aber leider auch eine Menge durchaus Unberufener, welche täglich mit dem Wohl und Wehe, ja dem Leben ihrer Mitbürger ein gefährliches, frevelhaftes Spiel treiben.

Mit Freuden begrüssen wir daher das entschlossene und Segen versprechende Zusammenstehen und Vorgehen erprobter Apotheker unserer Stadt, hoffentlich auch bald des ganzen Staates Wisconsin, welche von dem festen Bestreben nicht ablassen werden, in unsere zum Theil so mangelhaften pharmazeutischen Verhältnisse Licht und Ordnung zu bringen. Und Jeder, dem das Leben seiner Angehörigen, das Wohl seiner Mitmenschen am Herzen liegt, wird diese Herren in ihrem redlichen Bemühen eifrigst unterstützen; dessen sind wir sicher.

Zu jenem Wissen nun, welches der Pharmaceut zum richtigen Verständniss der Pharmacopœ, zur Receptur, zum leichteren Begreifen und im Gedächtniss Behalten der botanischen und druggistischen Nomenclatur besitzen soll, gehört auch die lateinische Sprache.

Er braucht nicht gerade in europäischer Manier zu einem zweiten Cicero oder Tacitus gemacht zu werden, er soll aber wenigstens im Stande sein, einen leichten Schriftsteller, wie den Cornelius Nepos, seine Bibel, die Pharmacopœ und alles das zu verstehen, was ihm bei seiner Thätigkeit in diesem einmal zur Sprache der Wissenschaft gewordenen Idiom unterläuft.

Gelegenheit, sich diese Kenntnisse im Lateinischen zu erwerben, bietet sich jetzt, da Herr Paul Brunnquell, welcher dieses Fach schon seit Jahren vertritt, einen mit erstem October d. J. beginnenden lateinischen Cursus eröffnen wird. Derselbe wird, sobald die Schüler genug vorgeschritten, auf das specielle sprachliche Verständniss der Pharmacopœ hinarbeiten.

Wir verweisen unsere Leser hiermit mit Vergnügen auf diese Gelegenheit (siehe das im heutigen Wegweiser enthaltene Inserat) und sind der Ansicht, dass hiermit schon ein Schritt zu dem von dem Apotheker-Vereine angestrebten Ziel geschehen ist.

Document 16.

[*Wegweiser*, d. 19. Sept. 1875. (p. 2, col. 1.)]

Für junge Pharmaceuten.

Unterzeichneter wird mit 1. October einen Abendcursus für die lateinische Sprache eröffnen.

Je nach den Anmeldungen wird ein Cursus für Anfänger und einer für Solche, welche schon Kenntnisse in dieser Sprache erlangt haben, eingerichtet werden.

Auf das Verständniss der lat. Pharmacopœ wird besondere Rücksicht genommen werden.

Paul Brunnquell,
Ecke Market und Oneida Str., Greve Block.
Sprechstunden Vormittags 9—12 Uhr.

Document 17.

[*Volks-Magazin*, Sunday, Sept. 19. 1875. (p. 413, col. 2)].

(Eingesandt.)

Im "Seebote" vom 17. d. M. befindet sich ein Eingesandt, welches auf ein anderes, wenige Tage früher in demselben Blatte erschienenes, die Vereinigung der Apotheker betreffend, Bezug nimmt.

Was vor allen Dingen den kritisirten Styl des früheren Artikels betrifft, so glaube ich nicht, dass derselbe aus Unwissenheit und Unkenntniss der deutschen Sprache, seitens des Herrn Verfassers, geworden ist, wie er ist, sondern dass der Herr Einsender den ganzen Artikel nur flüchtig und oberflächlich niedergeschrieben hat, in der Absicht, den Redactionen der betreffenden Zeitungen einen Inhalt über die Verhandlungen und Grundsätze des, sich bilden wollenden, Vereins zu geben. Die Redaktionen des "Banner" und der „Germania" haben es auch in dem Sinne aufgefasst (siehe die betr. Nummern), und kann ich kaum glauben, dass der Herr Verfasser den Artikel der Redaktion des "Seebote" übergeben haben wird, ohne eine derartige Bemerkung zu machen.

Der betreffende Herr hatte die Namen der, in der Versammlung anwesenden, Apotheker jedenfalls nur in der Absicht unter das betreffende Schriftstück gesetzt, um dieselben der Redaktion mitzutheilen, damit sie bei Abfassung eines, darauf bezüglichen, Artikels verwendet werden konnten.

Der Herr Einsender vom 17. d. sagt selbst, dass er nicht Apotheker ist, dass er jedoch mit der amerikanischen Apothekerei ziemlich vertraut sei. Die amerikanische Apothekerei, wie sie noch in dem grössten Theile der Ver. Staaten betrieben wird, hat eben ihre sehr grossen Mängel und ist in derselben dort, wo sie nach, durch die Legislaturen sanktionirten Gesetzen, die theils den in Europa gültigen, ähnlich sind, betrieben wird, z. B. New York, eine ganz bedeutende Aenderung zum Besseren eingetreten.

Wenn der Herr Einsender vom 17. Apotheker wäre, so würde er wissen, dass die grösste Gefahr für das Publikum nicht in den Fehlern liegt, die möglicher Weise

bei Anfertigung von Rezepten gemacht werden könnten, sondern gerade in dem Punkte, den er als so sehr erleichternd und jede Gefahr geradezu ausschliessend, preist, nämlich, dass für die amerikanische Apothekerei so ziemlich alles fix und fertig in chemischen Fabriken zu haben ist.

Wie fahrlässig hier zu Lande Fabriken betrieben werden, und die chemischen machen keine Ausnahme, wird fast Jedermann bestätigen können, der mit solchen Etablissements je in Berührung kam und jeder wirkliche Apotheker, der skrupulös genug ist, seine gekauften Chemikalien zu untersuchen, ehe er dieselben für die Rezeptur verwendet, kann ein Lied davon singen, wie mangelhaft dieselben häufig sind, selbst wenn sie aus unseren berühmtesten chemischen Fabriken stammen.

Vor etwa einem Jahr kam Einsender ein Fall vór, der die Fahrlässigkeit, mit der in chemischen Fabriken zu Werke gegangen wird, in das grellste Licht stellt. Einsender hatte schwefelsaures Morphin, das von einer unserer renommirtesten Fabriken stammte, gekauft und dasselbe jedesmal, wenn eine neue Flasche geöffnet wurde, untersucht. Bei der fünften oder sechsten Flasche fand derselbe, dass das in der Flasche enthaltene Morphin nicht rein sei, sondern fast 10 Prozent salzsaures Chinin enthalte, was wahrscheinlich aus Versehen, Absicht kann nicht vorliegen, unter das Morphin gekommen war. In diesem Falle konnte durchaus kein Unheil entstehen, selbst wenn es nicht bemerkt wäre, aber könnte nicht der umgekehrte Fall vorkommen, das bei eben solcher Fahrlässigkeit Morphin unter Chinin gekommen sein könnte? Wodurch vor etwa zwei Jahren in Frankreich und Belgien einige Menschenleben dem Versehen einer chemischen Fabrik zum Opfer fielen.

Alles, was wir verlangen und erstreben wollen, ist, das Gesetze passirt werden, die dafür sorgen, dass das Publikum so viel wie möglich geschützt werde, dass jeder Apotheker im Stande sein soll, seine, wenigstens in der Rezeptur gebrauchten, Chemikalien und Droguen zu untersuchen und, falls keine fehlerfreien Präparate zu haben sind, dieselben selbst anfertigen zu können.

Was den Passus der 15jährigen Praxis betrifft, so wäre darüber leicht hinweg zu kommen, wenn der Betreffende in einem, vor einer Kommission zu machenden, Examen, das jedenfalls nicht zu schwer ausfallen würde, die nöthigen Kenntnisse nachweist, auch könnte der Paragraph später, wenn nöthig befunden, auf irgend eine Art amendirt werden, da die betreffende Versammlung am 13. d. M. nur eine vorberathende war.

Otto A. Thiele.

Seebote wird ersucht copiren zu wollen.

[Copied by Seebote Sept. 20, p. 4, col. 4.]

Document 18.

[*Seebote*, Monday, Sept. 20. 1875. (p. 4, col. 4.)]

(Eingesandt.)

(*Anm. d. R.* In Bezug auf die Bemerkung des Herrn Einsenders, er könne kaum glauben, dass der Verfasser des erwähnten "Eingesandt" dasselbe der Redaktion des "Seebote" übergeben habe, ohne daran die Bemerkung zu knüpfen, dass er den Artikel nur flüchtig und oberflächlich niedergeschrieben, und dann wohl habe voraussetzen dürfen, die Redaktion werde etwaige Stylfehler korrigiren, haben wir zu entgegnen, dass uns keine derartige Mittheilung gemacht wurde und wir, da wir uns zu der Annahme berechtigt glaubten, eine aus solcher Quelle stammende Zuschrift bedürfe keines Schulmeisters, dieselbe ohne Abänderung in die Setzerei gaben. Ausserdem war das betreffende "Eingesandt" von einer Anzahl unserer prominentesten Apotheker unterzeichnet, was also die Annahme ausschloss, dass es nur ein flüchtig hingeworfener Entwurf sei. Hier mag übrigens die Bemerkung noch Platz finden, dass unserem Dafürhalten nach Zeitungsredaktionen nicht dazu da sind, um als öffentliche Korrektoren zu fungiren und die ihnen vom Publikum zugehenden Einsendungen, welche dazu noch unentgeltlich veröffentlicht werden, zu verbessern oder am Ende noch gar gänzlich umzuarbeiten.

Document 19.

[*Banner und Volksfreund,*

(Eingesandt.)

In dem Sonntagsblatte des „Herold" wurde ich durch ein Eingesandt auf einen Artikel und eine frühere Bemerkung des „Sebote" aufmerksam, und sehe ich mich deshalb veranlasst, zu meiner Rechtfertigung folgendes darauf zu erwiedern: Mein Eingesandt war blos als ein Prospect aufzufassen. Dasselbe ist laut Beschluss der Versammlung den Herren Redakteuren der betreffenden Zeitungen zugestellt worden und wurde von mir nur eilig aufgesetzt. Bei Abgabe desselben hielt ich keine Erörterung für nöthig, da ich voraussetzte, dass die Herren Redakteure eine „Revision" vornehmen werden.

Die Befürchtung des Herrn Einsenders, das der Styl des Eingesandt wissenschaftliche Bildung ausschlösse, fällt, glaube ich, vollständig zusammen, wenn ich dem Herrn Zeugnisse, nach dem Medicinalgesetze Preussens, von der Reife Obersecundas und mehrerer im Apothekerfache bestandenen Examina ebendaselbst, zur Einsicht stellen, ebenso ein amerikanisches Examendiplom nebst mehrerer Licensen zur Berechtigung des Verkaufs von Giften und Zusammensetzung von Medicamenten.

Was den Zweck des Vereins betrifft, so ist derselbe schon genügend erörtert, und der Herr Einsender, der von der Apothekerei schon viel zu verstehen glaubt, wird gewiss, wenn er sich noch etwas mehr damit beschäftigen wollte, die grossen Mängel erkennen, die ohne Gesetz diesem Geschäfte noch anhaften.

F. Roemheld.

Document 20.

[*Der Seebote,* Monday, Sept. 20, 1875. (p. 4, col. 3 and 4.)]

(Eingesandt.)

In der letzten Sonntagsnummer des „Herold" befinden sich zwei Aufsätze, in welchen die hier kürzlich aufgetauchte Apothekerfrage des Näheren besprochen wird, und müssen die darin entwickelten Grundgedanken über die, durch den zu bildenden pharmazeutischen Verein, anzustrebenden Zwecke, die volle Billigung eines jeden vernünftigen Menschen finden. Gewiss muss von einem jungen Menschen, der sich zum Apotheker ausbilden will, ein bestimmtes Mass von Schulbildung gefordert, jedoch müssen die in dieser Hinsicht gestellten Forderungen nach hiesigen und nicht nach europäischen Verhältnissen bemessen werden. In dem, "die wissenschaftliche Bildung des Pharmaceuten", überschriebenen Artikel wird die Kenntniss der lateinischen Sprache als unerlässlich nothwendig, auch für einen hiesigen Apotheker, hingestellt. So viel mir bekannt, sind sämmtliche hier in den Vereinigten Staaten massgebende Werke über Pharmacopœ in englischer Sprache abgefasst, und auch die mir zu Gesicht gekommenen Werke anderer Länder über dasselbe Thema, waren grösstentheils in den betreffenden Landessprachen geschrieben. Was die Nomenclatur in der Natur- und Arzneiwissenschaft anbetrifft, soll hier nur bemerkt werden, dass nicht nur der lateinischen, sondern auch der griechischen Sprache viele gebräuchliche Bezeichnungen entnommen sind. Mit demselben Rechte also, mit dem man von einem jungen Manne die Kenntniss der lateinischen, könnte man von ihm die der griechischen Sprache verlangen. Es wäre gewiss höchst erfreulich, wenn die alten Sprachen von der amerikanischen Jugend mehr kultivirt würden, der Behauptung aber, die Kenntniss der lateinischen Sprache sei für einen tüchtigen Apotheker durchaus nothwendig, können wir, nach reiflichem Ueberlegen, kaum beistimmen. Der Apotheker ist gewissermassen doch nur der Famulus des Arztes; bedenkt man nun aber wie viele Aerzte hier in den Ver. Staaten praktiziren ohne von der lateinischen Sprache eine Ahnung zu haben, so muss man das Verlangen, ein jeder sich der Pharmacopœ widmende junge Mann sollte die Fähigkeit besitzen lateinische Klassiker zu lesen, zum mindesten als verfrüht bezeichnen. Da gerade von den Herren Aerzten die Rede ist, soll ein Punkt, der in dem am 17. d. M. im "Seebote" erschienenen "Eingesandt" kurz berührt wurde, hier nochmals angeführt werden. Der Einsender meinte da, es würde viel zur Beseitigung von Missgriffen beitragen, wenn sich die Herren Aerzte bei'm Schreiben ihrer Rezepte einer deutlicheren Handschrift befleissigen würden. Diese Bemerkung, so kurz sie war, machte auf einen Uebelstand aufmerksam, dem von den Betreffenden grössere Beachtung geschenkt werden sollte. Dies polizeiwidrige Geschmier, aus dem oft buchstäblich kein Mensch klug werden kann, und bei welchem der Apotheker auf's Rathen angewiesen ist, muss ein Ende nehmen. Alle Apotheker Milwaukee's sollten derartige Skripturen zurückweisen und die betreffenden Aerzte wegen muthwilliger Gefährdung von Menschenleben anklagen. Ein gelehrter Mann muss vor allen Dingen, wenn nicht schön, so doch leserlich schreiben können, meint er aber er hätte das seiner Gelehrsamkeit wegen nicht nöthig, so soll ihm von Rechts wegen gezeigt werden, dass er sich auf dem Holzwege befindet.

The public preparation of electuary of theriac.

(From Peters: Aus pharm. Vorzeit I, p. 141.)

In dem "Eingesandt" im gestrigen "Herold" wird der schlechte Styl des zuerst ershienenen Aufrufs dahin entschuldigt, der Verfasser des Artikels hätte geglaubt, die Redaktion des "Seebote" würde die nothwendige Stylisirung selbst ausführen. Es sollte einem Jeden bekannt sein, wie sehr der Redakteur eines täglich erscheinenden Blattes mit Arbeit überhäuft ist, und demnach finden wir eine derartige Forderung zum Mindesten naiv. Die Redaktion soll das betreffende "Eingesandt" nicht nur unentgeltlich aufnehmen, sondern der mit Arbeiten überhäufte Redakteur auch den ihm in abgerissenen Worten mitgetheilten Gedanken das nöthige Kleid anziehen. Oft sind die Herren so gutmüthig und erfüllen derartige Forderungen, werden jedoch noch oft für ihre Mühe und Arbeit mit Vorwürfen und Grobheiten belohnt, wenn sie aus den ihnen übergebenen Anmerkungen beim besten Willen den Sinn nicht herausfinden konnten, den der betreffende Einsender hineingelegt zu haben vermeinte. Man kann deshalb der Redaktion des "Seebote" nur beistimmen, wenn sie die ihr übersandten Schriftstücke genau so der Oeffentlichkeit übergibt, wie sie ihr übergeben werden. Was dann weiter über die gesetzlich regulirten Verhältnisse der Apotheken New York's gesagt wird, muss hier aus Rücksicht für den Raum übergangen werden, erwähnt sei nur die Thatsache, dass Schreiber dieses im Jahre 70 in acht verschiedenen Apotheken New York's vergeblich nach bitteren Mandeln suchte und auch in der neunten nur zwei Unzen erhalten konnte, da nicht mehr vorhanden waren. Die Behauptung, dass gerade die grösste Gefahr für das Publikum darin bestehe, dass die amerikanischen Apotheker die meisten Präparate fix und fertig aus chemischen Fabriken beziehen, ist denn doch zum mindesten sehr verdächtig. Erstens, wenn in diesen Fabriken wirklich so unzuverlässig gearbeitet wird, wenn es nothwendig ist, dass alle aus denselben bezogenen Präparate einer genauen Untersuchung von Seiten des betreffenden Apothekers unterworfen werden müssen, wie kommt es dann, dass diese Fabriken bestehen können, dass sie nicht durch Schadenersatzklagen von Seiten der geschädigten Apotheker, durch Verminderung der Kundschaft u. s. w. schon längst zu Grunde gerichtet worden sind. Ferner sollte man doch meinen, wenn eine staatliche Ueberwachung durchaus nothwendig wäre, so wäre dieselbe entschieden leichter bei den wenigen chemischen Fabriken, als bei den tausenden Apotheken durchzuführen, und blos so beiläufig gefragt: Wie spielt das "Packetchen" denn eigentlich bei den Patentmedizinen? Die werden doch jedenfalls von keinem Apotheker hiesiger Stadt einer chemischen Analyse unterworfen und trotzdem bemüht sich ein jeder dieser Herren, so viel wie möglich von diesem edlen Stoff zu verkaufen.

So, das waren so einzelne Gedanken über die Angelegenheit von einem Unparteiischen. Das Bestreben, seinen Stand zu veredeln und von unlauteren Elementen frei zu halten, ist durchaus lobenswerth und gut, niemals aber soll man sich durch zu grossen Eifer für die gute Sache zu Ungerechtigkeiten gegen seine Standesgenossen hinreissen lassen. Ein Apothekerverein, wenn einmal gebildet und mit richtiger Umsicht geleitet, kann und wird sehr viel Gutes stiften, um jedoch die ganze Bewegung zu einer wahrhaft fruchtbringenden zu machen, ist es nothwendig, dass alle Apotheker hiesiger Stadt, die sich eines guten Rufs erfreuen, einmüthig zusammenwirken.

Document 21.

[Sonntags-Ausgabe des *Herold*, Sept. 26, 1875.
(p. 5, col. 3.)]

Noch etwas über die Bildung junger Pharmaceuten und die lateinische Sprache.

Die Montagsnummer des "Seebote" bringt auf den in der vorigen Sonntagsausgabe des "Herold" enthaltenen Artikel "Die wissenschaftliche Bildung des Pharmaceuten" eine Erwiederung, mit deren Ansichten wir uns durchaus nicht einverstanden erklären können und deshalb bei der von uns von Anfang an aufgestellten Behauptung beharren müssen. Wir unsererseits rechnen zu dem von dem "Seebote" Correspondenten verlangten Mass von Schulbildung des Pharmaceuten auch einen gewissen Schatz lateinischer Sprachkenntniss und betonten neulich ausdrücklich, dass das Verständniss eines leicht zu übersetzenden römischen Schriftstellers, wie des Cornelius Nepos, für den angestrebten Zweck ausreichend sein dürfte. Von der Fähigkeit, lateinische Schriftsteller überhaupt, das heisst so viel wie alle oder auch schwere als den genannten, lesen zu können, sprachen wir nicht und ersuchen deshalb den Einsender, uns nicht Worte unter zuschieben, welche wir nicht gebraucht.

Mit unseren bescheidenen Anforderungen an die Latinität des Pharmaceuten haben wir uns ferner auch noch lange nicht bis zu den Anforderungen verstiegen, welche in dieser Beziehung in Europa an den Pharmaceuten gestellt werden. Obwohl wir erst wenige Jahre in diesem Lande weilen, haben wir doch schon einsehen gelernt, dass die Verhältnisse desselben anders liegen, als die europäischen, und sind weit davon entfernt, die oft übertriebenen europäischen Anforderungen, über welchen so oft die Praxis des Lebens vergessen wird, als Norm aufzustellen. Wir wollen also, um es nochmals zu wiederholen, keinen Cicero und Tacitus, wohl aber mindestens einen kleinen Cornelius Nepos aus unseren sich heranbildenden Pharmaceuten machen. Und wenn der ganze Vortheil, welcher aus der Annahme unseres Vorschlages entstünde, nur die Gymnastik des Geistes, die Anstrengung des Denkvermögens, die Entwickelung logischen klaren Denkens wäre, so wäre das für den jungen Pharmaceuten allein schon genug der Anforderung, sich einigermassen Kenntniss einer Sprache zu erwerben, welche, wie wir neulich hervorhoben, nun einmal die Sprache der Wissenschaft geworden ist, auf welcher sich ferner das Gebäude sämmtlicher moderner romanischer Sprachen erhebt, an deren Hand wir endlich den Satzbau einer jeden anderen Sprache, sie möge einem beliebigen Sprachgebiete angehören, ja selbst unserer deutschen Muttersprache, besser verstehen und anwenden lernen. Der grosse directe und indirecte Nutzen, der reiche Genuss, welchen uns die lateinische Sprache bietet, sollten Jedem zugänglich sein, dessen Laufbahn auf wissenschaftlicher Thätigkeit und geistiger Fortbildung beruht. Und zu dieser Klasse der Menschheit gehören denn doch wohl die Pharmaceuten, jene blossen *famuli* der Aerzte, wie sie der Schreiber des Seebote-Artikels so unendlich liebenswürdig zu benamsen beliebt. Ja wohl, *famuli* der Aerzte, in jenem Sinne nämlich, dass jeder Stand auf Erden dem anderen dient, dass jeder für den anderen wirkt und nur vereinter Kräfte Walten unsere ganze Cultur schuf. Die alten amerikanischen Zeiten sind bald vorüber; wer Augen hat um zu sehen, muss bemerken, dass auch in Amerika die Berufsarten sich scheiden, dass man allmälig doch auch zu des alten Culturlandes Europa Verlangen kommt, in jedem Stande (nicht etwa in socialer Beziehung möge dieses Wort aufgefasst werden) speciell für denselben vorbereitete Kräfte zu haben, dass man nicht mehr heute Tischler, morgen Apotheker, heute Schlosser, morgen Maler sein kann. Jeder Beruf soll Vollkommenes leisten, verlangt gründliche, lang dauernde Vorbereitung und Ausbildung. Schon ist unser Land bevölkert genug, um für jedes Fach speciell ausgebildete Leute verlangen zu können. Das Pionierleben ist in den meisten der Staaten vorüber und überall da, wo schon das vollkommenste Culturleben herrscht, verlangt man auch Fachleute, welche auf der Höhe ihrer Aufgabe und ihrer Zeit stehen.

(Fortsetzung folgt.)

[Same title (Schluss). *Herold*, Monday, Sept. 27.
p. 3, col. 5.]

Wenn der Einsender des Artikels im "Seebote" die Behauptung aufstellt, dass die ihm zu Gesicht gekommenen Pharmacopœn anderer Länder grösstentheils in der Landessprache abgefasst seien, so hat er nur insofern Recht, wenn er von den illegalen, für den tüchtigen Apotheker aber in jenen Ländern nie massgebenden und mit keiner Autorität versehenen Ausgaben spricht. Die officiellen, allein Rechtskraft und Zuverlässigkeit besitzenden Pharmacopœn, so die preussische, hessische, hannoverische, hamburger (jetzt gilt für Ganz-Deutschland die *pharmacopœa germanica*), die russische, dänische, schwedische u. s. w. sind in lateinischer Sprache abgefasst. Auch zwei der hervorragendsten Compendien des Apothekers, *Hager's manuale pharmaceuticum* und Berg's Botanik, sind lateinisch ausgearbeitet.

Wenn Einsender weiss, dass die Nomenclatur der Arznei- und Naturwissenschaft nicht allein dem Lateinischen, sondern auch dem Griechischen entnommen ist, und, sich hierauf stützend, dann auch die Kenntniss der so unendlich schwierigen griechischen Sprache verlangt, sollte er doch auch wissen, dass die meisten der aus dem Griechischen stammenden Worte lateinisirt sind und deshalb in solcher Form nun auch der lateinischen Sprache angehören. Wie es nun nie von Schaden sein kann, recht viel und dies gründlich zu wissen, so wäre sicher auch die Kenntniss des Griechischen für alle Jünger der Naturwissenschaften höchst wünschenswerth, doch stellen sich dem zu grosse Schwierigkeiten entgegen und hat auch die Erlernung der griechischen Sprache lange nicht den Werth für uns, da ausser der neugriechischen keine einzige der modernen Sprachen in so innigem Verhältnisse, ja, überhaupt in einem zu ihr steht (Fremdwörter ausgenommen), wie die modernen romanischen Töchtersprachen zu dem Idiom der alten Römer. Wir trauen dem Einsender doch nicht das tolle Princip zu, dass man entweder alle oder keine der alten Sprachen kennen solle. Mezzopanti oder Knownothing! Mit demselben Rechte, mit welchem unser Unbekannter die Kenntniss des Griechischen neben dem Lateinischen verlangt, könnte er dem Pharmaceuten auch zumuthen, sich im Arabischen unterrichten zu lassen, da viele der Droguen-Bezeichnungen dieser Sprache entstammen, wie z. B. Alkali, Alkohol u. s. w.

Ueberhaupt scheint es Einsender auf die Herren Apotheker besonders abgesehen zu haben, denn er wünscht selbst, dass die alten Sprachen von der amerikanischen Jugend mehr cultivirt würden — nur die Pharmaceuten, jene blossen *famuli* der Aerzte, selbst die tüchtigen, schliesst er von dem Eintritt in den römischen Tempel aus. Also eine neue Sorte von Parias. Manchem Arzte, welcher, wie es hier zu Lande so häufig vorkommt, auch eine Apothke führt, wird es interessant und neu gewesen sein, zu lesen, dass von jetzt an in seiner Persönlichkeit zwei Individuen existiren, der Herr und sein *famulus*, nämlich Herr und Diener in einer Person. Wahrscheinlich zieht dann der letztere ersterem Abends die Stiefel aus. Vielleicht haben auch diese beiden Doppelgänger zweierlei Handschrift, eine schlechte der Arzt, eine gute der Apotheker.

So gerne wir dem Einsender gegenüber unsere heutigen Zeilen mit einer versöhnenden süssen Bemerkung schliessen möchten, so thut es uns doch leid, anstatt mit solchen Süssigkeiten ihm mit bitteren Mandeln aufwarten zu müssen.

Dass unser Disputant im Jahre 1870 in New York in acht verschiedenen Apotheken vergeblich nach dieser Frucht suchen musste, aber erst in der neunten solche, und zwar nur zwei Unzen fand, widerlegt die von anderer Seite gemachte Bemerkung bezüglich der gesetzlich regulirten Verhältnisse der New Yorker Apotheken nicht im mindesten, da im Jahre 1870 die neue pharmaceutische Gewerbeordnung noch gar nicht zu Rechten bestand, sondern erst 1872 eingeführt wurde und einen bedeutenden Umschwung der pharmaceutischen Verhältnisse zur Folge hatte. Also ein einfacher Anachronismus des Herrn Seebote-Einsenders, ein *peccatum in temporis ratione.*

Document 22.

[*Der Seebote*, Monday, Sept. 27, 1875. (p. 4, col. 1.)]

(**Eingesandt.**)

Im gestrigen "Herold" lässt ein Herr, der sich ungeheuer für die klassische Bildung der Apothekerjünglinge zu interessiren scheint, den Anfang einer gelehrten Abhandlung los, zu der sich jeder das Ende selbst denken kann. Der Refrain der ganzen Geschichte ist der: Für jeden jungen Mann, der Apotheker werden will, ist die Kenntniss der lateinischen Sprache durchaus nothwendig. Das der langen Rede, die schon gedruckt worden ist und die noch gedruckt werden soll, kurzer Sinn. Einsender bleibt bei seiner schon früher geäusserten Ansicht, dass es sehr schön und sehr wünschenswerth wäre, wenn die jungen Leute, die sich dem Apothekerfache widmen wollen, ein bestimmtes Mass klassischer Schulbildung hätten, jedoch die absolute Nothwendigkeit derselben für besagtes Gewerbe kann nicht anerkannt werden. Kinder! Kinder! warum geht ihr denn immer wie die Katze um den heissen Brei? Packt doch die Geschichte bei der Krone an, lasst erst die Aerzte die lateinische Sprache lernen und dann nehmt die Apotheker vor. Vorläufig genüge dies, da der Herold-Einsender noch nicht sein ganzes Herzchen ausgeschüttet hat. Sollte es nothwendig sein, soll der Schluss des gestrigen Eingesandt noch beantwortet werden. Aber nur nicht so viele unnütze Worte machen, immer ganz einfach, klar und deutlich seine Meinung sagen.

Eins soll hier nur noch angeführt werden, was besonders bemerkenswerth ist. Im alten Europa bemühen sich jetzt fast alle Völker, den alten Kastengeist abzuschaffen und hier im jungen freien Amerika schwärmen gerade die, welche drüben die Worte Gewerbefreiheit, persönliche Freiheit, Gleichheit, Brüderlichkeit u. s. w. stets im Munde führten, für Einführung aller möglichen Zwangsregeln mittelst der Gesetzgebung am meisten. Man sollte doch bedenken, dass es jedem freien Bürger freigestellt ist, wo und bei wem er seine Sachen kaufen will, und dass es jedem freien Bürger freigestellt sein und bleiben sollte, was er für sein Geld kaufen will, denn mit demselben Rechte, mit dem jetzt von Einigen die Beschränkung des Verkaufs von Giften verlangt wird, könnte von anderen die Beschränkung des Verkaufs von Gewehren, Messern, Aexten u. s. w. verlangt werden. Man kann sich oder auch Andere mit dem einen gerade so gut wie mit dem anderen gewaltsam in die Ewigkeit befördern.

[*Der Seebote*, Wednesday, Sept. 28, 1875. (p. 4, col. 4.)]

(Eingesandt.)

"Noch etwas über die Bildung junger Pharmaceuten und die lateinische Sprache."

So lautet die Ueberschrift eines in der Sonntags- und Montagsnummer des "Herold" erschienenen Artikels. In dem Artikel sucht der Einsender seine Ansicht, dass für einen hier in Amerika wirkenden Apotheker die Erlernung der lateinischen Sprache unumgänglich nothwendig sei, zu beweisen. Er unterstützt seinen Beweis mit gelehrt sein wollenden Redensarten, verlegt sich, um seine Abhandlung interessant zu machen, auf Wortkrängeleien, indem er aus dem im "Seebote" am Montag den 20. d. M. erschienenen "Eingesant" einzelne Sätze heraureisst, denen er dann Gedanken unterlegt, die kein vernünftiger Mensch in dem besagten "Eingesandt" finden kann u.s.w. Die Quintessenz des ganzen Artikels besteht jedoch in folgendem Satz: Es ist für jeden jungen Mann, der sich der Pharmacopœ widmet, die Kenntniss der lateinischen Sprache durchaus nothwendig. Vorläufig soll dann diese Behauptung hier zuerst gründlich untersucht werden. Um diese seine ausgesprochene Behauptung zu beweisen, führt der Schreiber des Artikels an, dass die offiziellen, allein Rechtskraft und Zuverlässigkeit besitzenden Pharmacopœen, so die preussische, hessische, hannoversche, hamburger, russische, dänische, schwedische, in lateinischer Sprache abgefasst seien. Nun gesetzt den Fall, der Herr hätte Recht, was in aller Welt gehen den hier in Amerika praktizirenden Apotheker die offiziellen, allein Rechtskraft besitzenden Bücher der genannten Länder an? Was hat hier in Amerika Hessen und Hamburg, Preussen und Russland zu thun oder zu befehlen? Die Pharmacopœ für unser Land, für die Ver. Staaten, ist in englischer Sprache geschrieben, und man sollte doch meinen, dass diese hier massgebender sein sollte und ist, als die von dem Schreiber des "Herold"-Artikels aufgeführten. Woher kommt es überhaupt, dass die in diesem Lande ansässigen Deutschen meistens alle hiesigen Verhältnisse nach preussischem oder russischem Brauch regulirt haben möchten; wenn sie nach genannten Gebräuchen so sehr lüstern sind, warum wanken sie denn nicht wieder nach den Ländern zurück, aus welchen sie vor Jahren ausgewandert sind? Es würde sie gewiss kein Mensch davon abhalten; aber gerade seine Ansichten, die einem in der Jugend in irgend einem anderen Lande eingebläut worden sind, hier in diesem Lande als massgebend für die ganze, aus so verschiedenen Nationalitäten zusammengesetzte Bevölkerung aufzustellen, ist denn doch ein wenig zu anmassend. Kein Eingewanderter, mag er nun Franzose, Engländer, Irländer oder Schwede sein, verfällt auf solche Gedanken, und nur allein der Deutsche möchte es immer so haben wie es bei ihm zu Hause war. Nun, kein Mensch hat etwas dagegen, wenn er, für seine Person, die ihm liebgewordenen Gebräuche beibehält, jedoch sollte er, der Eingewanderte, nicht von seinen Mitbürgern verlangen, dass sie sich dieselbe Sehnsucht nach ausländischen Sitten und Gebräuchen anschaffen sollen, die er besitzt. — Also Herr B......, nicht die ausländischen, angeblich nur in lateinischer Sprache (stimmt doch nicht so ganz) abgefassten Pharmacopœen, sondern die amerikanische, in englischer Sprache abgefasste, ist hier massgebend, und auch vollständig ausreichend; es ist also für einen hiesigen tüchtigen Apotheker die Kenntniss der lateinischen Sprache nicht so durchaus nothwendig, wie der Herr Verfasser des bewussten Artikels sie hinzustellen sich bemüht.

Eben dass die absolute Nothwendigkeit zur Erlernung der lateinischen Sprache für Apotheker dieses Landes nicht vorhanden wäre, das, und auch nur das wurde in dem Eingesandt vom 20. d. M. im "Seebote" behauptet. Wenn sich nun der Herr Herold-Einsender mit wahrhaft heldenmüthigem (?) Eifer für die klassische Bildung der Apotheker in's Geschirr wirft, ist das sehr lobenswerth, erstens aber sollte er in diesem heiligen Eifer doch immer hübsch die Kontrolle über seine Phantasie behalten, und nicht Dinge in dem von ihm kritisirten Schriftstück gelesen haben wollen, die gar nicht darin enthalten sind (die einzelnen, effektmachend sein wollenden Schlagwörter, als da sind Mezzopanti, Knownothing, Famulus, Parias, bittere und süsse Mandeln, hier zu widerlegen gebricht es uns an Zeit und Lust und wäre die Arbeit auch vollständig überflüssig, eine elende Wortfechterei), zweitens sollte er mit seiner Weisheit nicht erst nach acht Tagen, sondern gleich zum Vorschein kommen (wer wird überhaupt in unserer Zeit des Fortschrittes, wo die Geister, hauptsächlich die eben von Europa importirten, durch die Lektüre der alten Klassiker so gebildet sind, dass sie ihre Muttersprache beherrschen wie ein guter Ritter sein wohldressirtes Ross, so lange auf Antwort warten lassen!) und drittens, offen gestanden, und man soll immer hübsch ehrlich sein, kommt mir die Begeisterung, welche sich da in dem "Herold"-Artikel für die Ausbildung der jungen Pharmaceuten in der lateinischen Sprache breit macht, sehr verdächtig vor, ich konnte den Spruch: "es mag wohl Eigennutz, nicht Menschenliebe sein" bei'm Lesen des Artikels nicht mehr aus dem Sinn bekommen. — Zum Schluss empfehlen wir nun noch dem Verfasser des "Herold"-Artikels die aufmerksame Lektüre der betreffenden "Eingesandt" im "Seebote", darin wird er finden, dass der Schreiber derselben das Erlernen der lateinischen Sprache für sehr gut und fruchtbringend, nicht nur für angehende Pharmaceuten, sondern auch für andere junge Leute hält, dass er jedoch der Ansicht, ohne Kenntniss der lateinischen Sprache könne kein tüchtiger Apotheker bestehen, nicht beipflichten kann.

(To be continued.)

MONTHLY REVIEW.

Commercial Reports.

Semi-Annual Report of Schimmel & Co. (Fritzsche Bros.), Leipzig & New York.

NOVELTIES.

Savory Oil. We have distilled the fresh blooming plant of Summer savory, *Satureja hortensis* L., cultivated upon our experimental plantation at Miltitz. 0.097 per cent. of an oil were obtained which has the sp. gr. of 0.904 and an opt. rot. of + 0° 4′: it requires 9 parts of 80 per cent. alcohol for solution, forming only a turbid solution with 70 per cent. alcohol. The oil contains 38 per cent. of phenol (carvacrol).

The composition of savory oil was ascertained by Jahns[1]; it contains besides carvacrol, phenol, cymol and a terpene not yet examined.

The odor of the oil is pleasantly aromatic. On account of the very small yield its price is too high to admit of distillation on a large scale and of introduction into practical use.

Savory Oil, Mountain. This oil was obtained from the Mountain savory, *Satureja montana* L., also cultivated upon our plantations. The yield of oil was 0.18 per cent.; its sp. gr. is 0.939 and its opt. rot. — 2° 35′. The oil gives a clear solution with 4.5 and more parts of 70 per cent. alcohol and with 1½ and more parts of 80 per cent. alcohol. It contains 65 per cent. of phenol. Its odor is identical with that of common savory oil, and its composition is nearly so. According to Haller's[2] examination, it consists mainly of carvacrol and contains, besides, another phenol having a somewhat higher boiling point, and a terpine.

Balsam Tansy Oil. This oil was distilled from cultivated green and blooming plants of the balsam tansy, *Tanacetum balsamita* L.; 0.064 per cent. of oil was obtained. Its odor is balsamic and agreeable but less characteristic, much recalling that of the oil of common tansy. Its sp. gr. is 0.943, its opt. rot. — 53° 48′ at 16° and its sap. fig. 21. When standing in a cool place, paraffin-like crystals separate at the surface of the oil. It is not soluble in 80 per cent. alcohol but renders a clear solution with 1 to 2 parts by volume of 90 per cent. alcohol: upon a further addition of alcohol, the solution becomes turbid and a white flocculent separation (paraffin?) takes place. The oil distills between 207° and 283°, and the following fractions may be obtained:

1. from 207° to 220°	10.4 per cent.,
2. " 220° " 230°	16.8 "
3. " 230° " 240°	18 "
4. " 240° " 250°	12.4 "
5. " 250° " 283°	21.2 "
Remainder	21.2 "

Xanthorrhoea gum Oil. The gum-resin of some Australian grass trees (*Aphyllantheae*), especially of *Xanthorrhoea hastilis* R. B. indigenous to New South Wales recently came into use for technical as well as for medical purposes. The yellow grass tree gum, *resina lutea*[3] on distillation yields 0.37 per cent. of a yellow oil of an odor resembling that of styrax. It has the sp. gr. of 0.937 and the opt. rot. of — 3° 14′. When it was saponified by an alcoholic potassa solution, the following factors were found: factor of saponification, 74.3, factor of acidity, 4.9, factor of esters, 69.1. The free acid was separated by shaking the oil with a dilute soda solution, and proved to be cinnamic acid, melting at 133°. When the oil was saponified by an alcoholic potassa solution, quite an amount of cinnamic acid was separated from the lye, for 200 Gm. of oil yielded about 40 Gm. of cinnamic acid, recrystallized from its solution in water.

The saponified oil boils between 145° and 240°. When it is distilled, a first fraction is obtained, boiling at 145° to 150° and having the properties of styrol. When this fraction is acted upon by bromine in a cooled ether-solution, styrolbibromide is obtained in fine crystalline needles, having a melting point between 74° and 75°.

According to a more recent examination of the xanthorrhoea gum by K. Hildebrand[4], it contains, besides cinnamic acid, paracumaric acid, both free and combined with xanthoresinotannol; further, styracine paraoxybenzaldehyde, and probably also small quantities of cinnamic acid phenylpropylic ester and traces of vanillin.

As yet the oil is of no practical use.

Larch-needle Oil. The essential oil of the leaves of the European larch, *Larix europaea* D. C., seems not yet to have been obtained on a commercial scale. The needles on distillation yield only 0.22 per cent. of oil, which has the sp. gr. of 0.878 and a dextrogyre rotation of 0° 22′ at 18°. It is soluble in 5 parts and more of 90 per cent. alcohol; its factor of saponification is 23.3, and after the acetylisation 46.

Granted that the ester of the larch-needle oil is bornyl acetate, as is the case with most coniferous oils, the above figures would indicate 8.1 per cent. of bornyl acetate in the original oil, and of 16.1 after the acetylisation of the oil or, calculated according to the amount of the alcohol contained in the original oil: ester-borneol 6.53 per cent., free borneol 6.14 per cent., total amount of borneol 12.76 per cent.

When the oil is subjected to fractional distillation on a free fire, the following fractions were obtained:

1. from 160° to 165°	30 p. c.	Optical rotation +4°15′.
2. " 165° " 170°	24 "	
3. " 170° " 180°	16 "	
4. " 180° " 190°	8 "	
5. " 190° " 200°	4 "	
6. " 200° " 230°	9 "	
Remainder	9 "	
	100 p. c.	

The oil has a refreshing, pleasant larch-needle fragrance. A considerable drawback to its very desirable use consists in the small yield of oil and the difficulty of obtaining large quantities of the fresh needles.

Botany and Pharmacognosy.

The Origin of Storax.

This balsam is not, as has been believed, a product of the bark of the tree producing it, but originates in the young wood. It is not a physiologically normal secretion, but a pathological product resulting from severe injuries to the bark. The first effect of such lesion is the development of schizogenetic glands, which later become modified to confluent lysigenetic lacunæ — a procedure without analogue in the vegetable kingdom. Dr. Josef Moeller, to whom is due this discovery, was able to demonstrate these changes for the genuine oriental storax from fragments of tissue found in the balsam. A histological study of stems of the American species furnishing the sweet gum balsam was made.

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[1] Ber. d. deutsch. chem. Ges. 15 (1882), p. 816.

[2] Comptes rendus 94 (1882), p. 132.

[3] Wiesner. Die Rohstoffe. S. 148.

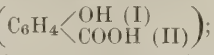
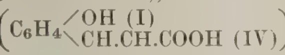
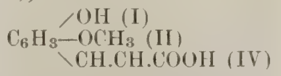
[4] Arch. d. Pharm. 234 (1896), p. 703.

His experiments with *Liquidambar styraciflora* L., the sweet gum tree, gave interesting results. Semicircular incisions were made in the bark penetrating into the adjacent young wood. The result of the wound was the complete loosening of the bark from the underlying wood, which died. The elements of this dead wood were filled with a yellow material. The vessels contained thyloses, those more centrally located, uncut included, while the wood layer newly developed after the injury consisted only of cells of pathological parenchyma in which schizogenetic glands were to be observed, which united to form lysigenetic lacunæ, the reservoirs of the newly secreted balsam.

The old, unincised wood showed a completely normal structure, in which balsam receptacles were lacking. [Pharm. Post, 1897, p. 455.]

Constitution of Resins.

In a paper read before the XII International Medical Congress in Moscow, Prof. A. Tschirch summarizes the chief results reached during eight years of study on substances known as resins.

From the first, Tschirch assumed that resins are mixtures and that the first condition for arriving at a better knowledge of them was to separate them by means of indifferent agents into their constituents. Investigation has shown that a great number of resins contain esters of the aromatic acids. For example, Peru balsam, balsam of tolu, Siam benzoin and dragon's blood yield on hydrolysis, benzoic acid (C_6H_5COOH); ammoniacum, salicylic acid  $\left(C_6H_4\begin{matrix}\diagup OH\ (I)\\ \diagdown COOH\ (II)\end{matrix}\right)$; likewise tolu balsam, balsam of Peru, storax, benzoin, acaroid resin and the resin of aloes yield cinnamic acid ($C_6H_5CH.CH.COOH$); the acaroid resins, para-cumaric acid  $\left(C_6H_4\begin{matrix}\diagup OH\ (I)\\ \diagdown CH.CH.COOH\ (IV)\end{matrix}\right)$. The resins of many *Umbelliferæ* yield ferulic acid  $C_6H_3\begin{matrix}\diagup OH\ (I)\\ -OCH_3\ (II)\\ \diagdown CH.CH.COOH\ (IV)\end{matrix}$ which is present as ester in asafetida and galbanum and easily goes over into umbellic (Umbellsäure) acid and umbelliferon.

Although the constitution of the acids of the esters characteristic for the resins is determined, the structure of the alcohols of these resin-esters is not understood. They show, however, uniformly reactions which the resins lack. Tschirch calls this class of bodies tannols. Among the tannols certain relations are to be seen of the nature of homologies. The tannol of the yellow acaroid resin has the formula $C_{43}H_{46}O_{10}$, the tannol of the red acaroid resin, $C_{40}H_{40}O_{10}$, giving a difference of $3CH_2$. The tannol of Peru balsam has the formula $C_{18}H_{20}O_5$, the tannol of tolu balsam $C_{17}H_{18}O_5$, the difference CH_2.

The bodies are therefore homologous.

Not less than seven of the tannols contain six carbon atoms in the molecule, or a multiple of six. All have only one hydroxyl.

The further study of the tannols is in prospect. [Pharm. Post, 1897, p. 455.]

Some Useful Plants of New Guinea.

Among other notes on a collection of plants sent by Missionary Bammler from New Guinea to the Botanical Museum of Berlin some references to the uses to which certain plants are put seem worthy of note.

Among the *Monocotyledones*, a small number are used as remedies.

Kyllingia monocephala Rttb., a wayside grass, furnishes its sap which, mixed with lime, serves as a remedy for ring worm. A like use is made of another species of grass, *Fimbristylis diphylla* Vahl., which grows on the fields and along the road-sides.

Cordyline terminalis Kth., a shrubby plant of wide distribution in that quarter of the globe, occurs in both green and red-leafed forms. The leaves of the latter are used as ornament at dances. The expressed sap of the green-leafed form is supposed to be styptic. It is poured over wounds caused by cutting and bruising.

In Bammler's notes, a number of Dicotyledonous plants are referred to as furnishing remedies.

Fleurya interrupta (L.) Gaud. Before blood-letting, the seat of pain is struck (geschlagen) with this plant. A village weed, 50 cm. in height.

Cæsalpinia Bonducella Flem. The liquid obtained by boiling down the leaves of this climber in water to an extract is given at the first menstruation.

Soulamea amara Lam. The sap expressed from the leaves is an effective remedy against lice. A bush found in rocky places.

Hearnia sapindina F. v. Muell. The leaves of this forest tree are boiled down in water and the tea is given to women in confinement.

Euphorbia serrulata Reinw. The herb boiled in cocoa nut milk is given for catarrh. A field weed.

Excoecaria Agallocha L. The sap expressed from the fresh bark taken from this shrub, mixed with cocoa nut milk (Cocosnusswasser) and drunk is a strong emetic and purgative. Although the plant is decidedly poisonous, the powerful effects ascribed to it heretofore are probably to be regarded as fabulous. It has been related that the sap introduced into the eye causes blindness. From the above, this seems impossible. In breaking up the soil in Kaiser Wilhelmsland, dangerous eye troubles are incurred due to the sap of a *Gluta*. The species was not determined.

Aleurites molluccana (L.) Willd. The seeds of this tree (reaching a height of 25 meters) are edible. An oil is expressed from this which after baths is rubbed into the skin.

Ocimum canum Sims. A weed, one meter high with blue flowers. The freshly expressed sap is inhaled through the nose for catarrh. When boiled, the plant is an abortive.

Morinda citrifolia L. A bush in rocky locations, said to be poisonous; the root is used to color *Tapa* fabric yellow.

[Notizblatt des königl. bot. Gart. u. Mus. zu Berlin. No. 2. 1895, p. 44.]

New Remedies.

Silver Sulphophenylate.

This silver salt, proposed as an antiseptic, was first prepared by Zanardi by the action of phenylsulphonic acid upon silver carbonate. It is sensitive to light.

[Ph. Ztg., 1897, p. 597; from Boll. chim. Farm., 1897, p. 449.]

Phosphoguaiacol.

This is the name given by Ballard to guaiacol phosphite, a white, crystalline, non-caustic powder of a sharp taste and mild odor. The crystals melt at 77.5° and are soluble in water, ether, chloroform, acetone, benzine and the fatty oils. For method of preparation see Ph. Rev. 15, p. 118 under "guaiocol phosphide" (should read guaiacol phosphite).

Benzo-jodhydrin.

Chenal has recommended this compound as a substitute for potassium iodide, claiming as advantages that it never causes iodism and that much smaller quantities are required to produce the same therapeutic effect. Benzo-iodhydrin is prepared by heating benzoyl iodide with epichlorhydrin to 70°. It is crystalline, unctuous to the touch, and soluble in ether, alcohol and chloroform. It is preferably administered made up into granules with sugar. Single dose, corresponding to a gramme of potassium iodide, is 0.13 g., containing 0.05 iodine, 0.014 g. chlorine, 0.05 g. benzoic acid.

[British Medical Journal, 1897; Pharm. Centralh., 1897, p. 372.]

Hydroxyl-free Cod Liver Oil.

Under this name, the firm Peter Möller, Christiania, has placed upon the market a cod liver oil claimed to be free from all oxy-fatty acids, to whose presence the disagreeable belching caused by the ordinary oil is supposed to be due. The manufacture of this new oil is the same as that of the old, except that the process is conducted in an atmosphere of carbon dioxide, thus preventing all action of the atmospheric oxygen upon the readily oxydizable glycerides of jecoleic and therapinic acids. The taste of this new preparation is said to be very mild. To prevent its coming in contact with air, the oil is placed on the market only in well-filled bottles.

[Ph. Centrh., 1897, No. 34; Ph. Ztg., 1897, p. 597.]

Chinopyrine.

Laverau, a French physician, was the first to employ subcutaneously, concentrated solutions of quinine with antipyrine, containing 30 p. c. of quinine and 20 p. c. antipyrine. In no instance did the patient feel the pain always accompanying the injection of either of these substances alone. G. Santesson now employs 50 p. c. solutions of quinine hydrochloride made with antipyrine, under the name of chinopyrine. The quantity of water used in making these solutions is scarcely sufficient to moisten the mixed powders, but upon warming, the mass "melts" and changes to a clear, syrupy, slightly yellow or nearly colorless liquid. This liquid is quite permanent; even upon evaporation no crystals form, but only a varnish-like mass remains. The pure, dry antipyrine in a way acts as a solvent for quinine hydrochloride. When the mixed dry substances are heated together in a test-tube at the temperature of the water-bath, they gradually change into a clear, colorless, tough mass, which does not become crystalline upon cooling. Santesson inclines to the opinion that the change is a chemical one, since the action of chinopyrine differs decidedly from that of its two components. Santesson's clinical observations agree with those of Laverau. In no case did the hypodermic injection of chinopyrine cause pain, inflammation, abscesses, gangrene or like results.

[Ph. Ztg., 1897, p. 623; from D. Med. Wschr., 1897, No. 35.]

Orthoform.

This is the name given by Einhorn and Heinz to p.-amido-m. oxybenzoic acid-methylester, recommended by them as a local anæsthetic in the treatment of wounds. Orthoform is a white, light, voluminous, crystalline powder without odor or taste, only slightly and slowly soluble in water. Upon the latter property its advantage over other anæsthetics is said to depend. Just sufficient substance is dissolved to produce the anæsthesia; on the other hand, solution proceeds so slowly that only small quantities are removed by resorption, so that the action of the drug can extend through several days. With hydrochloric acid, orthoform forms a crystalline salt, readily soluble in water and having an acid reaction. This salt has the same therapeutic effect as orthoform itself, but on account of its acid reaction can not find as extensive application. It should not be applied to sensitive mucous membranes nor used for hypodermic injections. Since orthoform, on account of its slight solubility, produces its analytic effect only wherever it comes in direct contact with the tissues, it is necessary to distribute it as uniformly and thoroughly as possible. It is therefore best applied as a fine powder or rubbed up into a salve (in the case of wounds or tumors). The manufacturers of orthoform are the Höchster Farbwerke.

[Ph. Ztg., 1897, p. 597; from Münch. Med. Wschr., 1897, No. 34.]

Tannalbin.

In his search for a tannin preparation which would be unaffected by the gastric juice, but would liberate tannic acid in the intestines, R. Gottlieb hit upon the compound of tannic acid with albumen, which seems to fulfill all the requirements. To this he gave the name of tannalbin.

G. R. Schmidt has recently developed a method of preparing a compound equal in value to the tannalbin of commerce, but which can be made at a much lesser expense. The process is as follows: 10 p. of a 10 p. c. solution of albumen are mixed with 6.5 p. of a 10 p. c. tannin solution; the resulting precipitate is collected on a strainer, washed well, expressed, and dried at 30°. The mass is then powdered, the powder passed through a fine sieve and after spreading in thin layers, is heated for six hours to 120°. The resulting preparation is identical with the commercial tannalbin. After digesting for 2—3 hours at 37—40° with a 1 p. c. soda solution, 24—40 p. c. remained undissolved. Under the same conditions, using an acid pepsin solution (1 g.

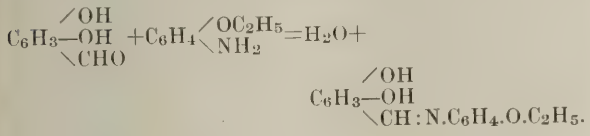
pepsin, 2.5 g. hydrochloric acid, 150 g. water), the undissolved residue amounted to 35—57.5 p. c. The requirements for a good tannalbin are given by Schmidt as follows:

Tannalbin should not be astringent to the taste. After 2—3 hours digestion with artificial gastric juice at 37—40°, less than half should dissolve, while digestion with 1 p. c. soda solution should result in the solution of more than 50 p. c.

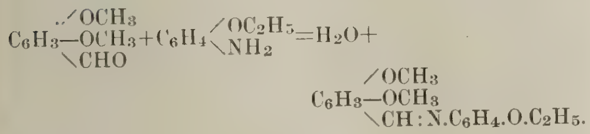
[Pharm. Zeit., 1897, p. 538.]

Some New Antipyretics.

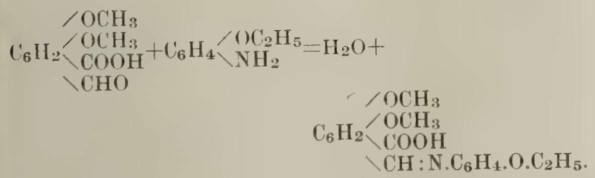
These are the p.-phenetidine condensation products with protocatechuic aldehyde, dimethyl protocatechuic aldehyde (methyl vanillin) and opianic acid, respectively (see also vanillin-p.-phenetidine, Ph. Rev. 15, p. 143). These compounds are all prepared by heating p.-phenetidine with the respective substances to 120°. The reactions in the three cases may be expressed:



$$C_6H_3\left\langle\begin{matrix}OH\\OH\\CHO\end{matrix}\right. + C_6H_4\left\langle\begin{matrix}OC_2H_5\\NH_2\end{matrix}\right. = H_2O + C_6H_3\left\langle\begin{matrix}OH\\OH\\CH:N.C_6H_4.O.C_2H_5\end{matrix}\right.$$



$$C_6H_3\left\langle\begin{matrix}OCH_3\\OCH_3\\CHO\end{matrix}\right. + C_6H_4\left\langle\begin{matrix}OC_2H_5\\NH_2\end{matrix}\right. = H_2O + C_6H_3\left\langle\begin{matrix}OCH_3\\OCH_3\\CH:N.C_6H_4.O.C_2H_5\end{matrix}\right.$$



$$C_6H_2\left\langle\begin{matrix}OCH_3\\OCH_3\\COOH\\CHO\end{matrix}\right. + C_6H_4\left\langle\begin{matrix}OC_2H_5\\NH_2\end{matrix}\right. = H_2O + C_6H_2\left\langle\begin{matrix}OCH_3\\OCH_3\\COOH\\CH:N.C_6H_4.O.C_2H_5\end{matrix}\right.$$

The protocatechuic aldehyde-p.-phenetidine crystallizes with 2 molecules of water and melts at 220°, undergoing decomposition at that temperature. It is soluble in water and possesses hypnotic as well as antineuralgic and antipyretic properties. Methylvanillin-p.-phenetidine crystallizes from hot water with 2 molecules of water of crystallization, the crystals melting at 210°. Opianic acid-p.-phenetidine is a crystalline powder, melting at 175°, insoluble in water, but readily soluble in the ordinary immiscible solvents. Both of the latter compounds are decided hypnotics as well as antipyretics. The method of manufacture of all three of these condensation products is covered by German patents held by C. Goldschmidt, of Frankfurt a. M.

Literary.

Books and Pamphlets Received.

Deutsche Verlags-Anstalt—Stuttgart. Lexikon der gesamten Technik und ihrer Hilfswissenschaften. Herausgegeben von Otto Lueger im Verein mit Fachgenossen. Mit zahlreichen Abbildungen.
25. Abtheilung: Konsolen—Kuppelungen, pp. 641—800.
26. Abtheilung: Kuppelungen—Linde, pp. 1 bis 160.

*Felix Alcan, Éditeur—Paris. Dictionnaire de Physiologie par Charles Richet, Professor de Physiologie à la Faculté de Médecine de Paris. Troisième fascicule du Tome II, pp. 641—978, avec 36 gravures dans le texte. 1897.

Verlag von Wilhelm Engelmann—Leipzig. Lehrbuch der allgemeinen Chemie. Von Dr. Wilh. Ostwald, Professor an der Universität zu Leipzig. In zwei Bänden. Zweiten Bandes zweiter Theil: Verwandtschaftslehre. Zweite Lieferung, pp. 209—416. 1897. M. 5.00.

—— Die wissenschaftlichen Grundlagen der analytischen Chemie. Elementar dargestellt von W. Ostwald. Zweite vermehrte Auflage. Ein Bd., pp. x, 200. 1897. M. 5.00; geb. M. 5.80.

——Die natürlichen Pflanzenfamilien nebst ihren Gattungen und wichtigeren Arten, insbesondere den Nutzpflanzen. Unter Mitwirkung zahlreicher hervorragender Fachgelehrten begründet von A. Engler und K. Prantl, fortgesetzt von A. Engler, ord. Professor d. Botanik und Direktor des botan. Gartens in Berlin. Lieferungen 155—158. Nachtrag und Register zu Theil II–IV. 1897. Subscriptions pro Heft zu zwei Lieferungen M. 3.00. Einzelpreis M. 6.00.

Verlag von Julius Springer—Berlin. Pharmaceutischer Kalender 1898. Mit Notizkalender zum täglichen Gebrauch nebst Hilfsmitteln für die pharmaceutische Praxis. Herausgegeben von Dr. H. Boettger und Dr. B. Fischer. In zwei Theilen.
I. Theil: Kalendarium, Schreib- und Notizkalender, Hilfsmittel für die pharmaceutische Praxis, pp. 190.
II. Theil: Pharmaceutisches Jahrbuch. Siebenundzwanzigster Jahrgang. 1898. M. 3.

Lea Brothers & Co.—Philadelphia. A text-book of practical therapeutics with especial reference to the application of remedial measures to disease and their employment upon a rational basis. By Hobart Amory Hase, Professor of Therapeutics and Materia Medica in the Jefferson Medical College. Sixth edition, enlarged, thoroughly revised and largely re-written. One vol., pp. 756. 1897. Cloth, $3.75; leather, $4.75.

Verlag von Otto Wigand—Leipzig. Jahresbericht über die Leistungen der chemischen Technologie mit besonderer Berücksichtigung der Elektrochemie und Gewerbestatistik für das Jahr 1896. Bearbeitet von Prof. Dr. Ferdinand Fischer in Göttingen. XLII. oder Neue Folge. XXVII. Jahrgang. Ein Bd., pp. xxxvi, 1244, 1897. M. 24.00.

Otis Clapp & Son, Agents—Boston. Pharmacopœia of the American Institute of Homeopathy. Published for the Committee on Pharmacopœia of the American Institute of Homeopathy. One vol., pp. 674. 1897.

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* This fascicle contains the continuation of the article *cerveau*, which was commenced in fascicle five and which evidently will be completed in the seventh fascicle. The review will, therefore, be postponed until this article is completed. *Ed.*

Chemical Publishing Co. — Easton, Pa. Organic Chemistry for the Laboratory. By Dr. W. A. Noyes, Professor of Chemistry in Rose Polytechnic Institute, Terre Haute, Ind. One vol., pp. x, 257.

Author — Cincinnati. Ueber kalifornische Manna. By J. U. Lloyd. Reprint from the Berichte d. d. pharm. Gesellsch. 1897. Pamphlet, pp. 9.

Author — Madison, Wis. North American species of Amblystegium. By Lellen S. Cheney. Reprint from the Botanical Gazette, 1897. Pamphlet, pp. 58.

Author — Atlanta, Ga. Commercial Fertilizers and Chemicals, inspected, analyzed and admitted for sale in the State of Georgia, 1897. By Dr. George F. Payne, State Chemist. Brochure, pp. 116.

Author—Helfenberg. Ueber die Werthbestimmung der Kolanuss und des Kolaextraktes. Vortrag, gehalten vom Verfasser auf der 69. Versammlung Deutscher Naturforscher und Aerzte in Braunschweig, Abth. f. Pharmacie und Pharmacognosie. Von Dr. Karl Dieterich. Sonderabdruck aus d. Pharm. Ztg. 1897, No. 16. Pamphlet, pp. 11.

Reviews.

Incompatibilities in Prescriptions. For students in pharmacy and medicine and practicing pharmacists and physicians. By Edsel A. Ruddiman, Ph. M., M. D., Adjunct Professor of Pharmacy and Materia Medica in Vanderbilt University. First edition. 1 volume, 267 pages, 8vo. John Wiley and Sons, New York, 1897. $2.00.

It is one of the unfortunate results of the present condition of pharmacy in this country that most pharmacists, when confronted by problems new to them, have neither the time nor the library and laboratory facilities for investigating them, and for finding either solutions to the problems or means of circumventing difficulties. Especially is this true at the prescription counter, where often dangerous prescriptions are filled, due to the haste or ignorance of the dispenser, or are refused, where a proper understanding of the conditions would have remedied the trouble.

The book before us serves as an excellent guide and reference book at the prescription desk for those pharmacists whose means will not allow them to secure the larger works in chemistry and therapeutics. Its concise form will also make it very valuable to others who are more fortunate in this respect.

The author has divided his work into two parts, the first containing in alphabetical arrangement many drugs and most of the important chemicals of the materia medica, together with explanations of their incompatibilities, physiological as well as chemical and pharmaceutical. In the case of chemical incompatibilities the products of the decomposition are given whenever known, while the many references given in the text enables the reader to look up further information in the larger works of reference or in the original articles. All the common cases of incompatibility are treated of, but besides these, many of rarer occurrence; that the work has been brought up to date is shown by the large number of new remedies included in the subject matter.

The second part consists of a list of over 300 incompatible prescriptions, intended to give the student of pharmacy or medicine practice in discovering incompatibilities, while the notes which follow serve as answers to his solutions.

The book is printed in clear type on good paper and is remarkably free from typographical errors for a first edition. It should certainly find favor with the medical as well as with the pharmaceutical profession. *Richard Fischer.*

Die natürlichen Pflanzenfamilien nebst ihren Gattungen und wichtigeren Arten, insbesondere den Nutzpflanzen. Unter Mitwirkung zahlreicher hervorragender Fachgelehrten herausgegeben von A. Engler, Professor der Botanik und Direktor des botanischen Gartens in Berlin. Lief. 155—158. Nachtrag und Register zu Theil II—IV. Bogen 1 bis 12. Verlag von Wilhelm Engelmann in Leipzig. 1897.

At the close of that part of this great work dealing with the flowering plants, the editor finds that since the printing of the various installments composing this section of the work, much has appeared which can not be allowed to go without notice in this publication. During the last ten years, the exploration of hitherto little known regions by students of botany has brought much to light which is important to systematics. This period has likewise brought in with it the increased agitation of the nomenclature question and the putting into operation by many monographers of the principle of priority. This has resulted in the resuscitation of many old generic names and has necessitated some reference to them in a work of this scope. O. Kuntze's Revisio generum plantarum (1891) made a thoroughgoing use of this principle and compelled a consideration. In deciding how far to follow Kuntze's dictum and how far to listen to arguments from convenience contained in the protests from workers in applied botany in its various branches and from others desirous of seeing the names long in use retained, Engler determined to retain those generic names which have been in use for fifty years even though according to the priority principle they should be superseded. This latter name, though a prior one, after being unused for this period, is regarded merely as a synonym. If, however, such a name has been revived and used in a new monographic treatment of a group or in a large systematic work and is used consistently in the description of species, it has been likewise restored in this work.

In these supplementary numbers, the literature that has appeared since the publication of those parts dealing with the various families and genera has been cited and the *Pflanzenfamilien* brought up to the end of the year 1896.

As a result of the most painstaking work, directions for the insertion of this additional matter in its proper connections are given and if one has the patience it is now possible for the reader by using the original text and the supplementary numbers to get an idea of any genus as it was understood to botanists less than a year ago. In spite of some inconvenience necessary to the use of this appendix, it is no small achievement that so large a mass of matter can thus be brought up to date. It is in another direction of no small interest to be able to see thus set apart the achievements of a decade of study in systematic botany.

Dr. Engler has included in this supplement the chapter from his "Syllabus der Vorlesungen etc." on the principle of systematic arrangement of plants, especially of the Augiosperms. This statement of principles by the author of this work will make clear the reasons determining many points of arrangement by giving the reader the key to the situation.

It is out of the question to go into detail concerning the matter here inserted. Spermatozoids in *Ginkgo* leads to the establishment of a new family, the *Ginkgoaceæ*, distinguished by the presence of these bodies. Chalazogamy and Guignard's centrospheres in the reproductive apparatus of plants are discussed and illustrated. Thus by the frequent emendations and additions contained in the numbers at hand, the families up to the *Leguminosæ* are brought up to the present state of our knowledge.

As this work draws near to its completion, the magnitude of the undertaking becomes plainer and the service rendered to botany becomes better appreciated. *Rodney H. True.*

Vorlesungen über Bakterien von Dr. Alfred Fischer, a. o. Prof. der Botanik in Leipzig. Ein Bd., pp. ——. Mit 29 Abbildungen. Verlag von Gustav Fischer in Jena. 1897. M. 4.00.

A new book on bacteriology written from the usual standpoint demands nowadays a good reason for its existence. Bacteriology in its usual aspects has been so well and so thoroughly treated that aside from new material added there is not much justification for the rapid multiplication of manuals that is in vogue at the present time.

Such justification is found in the present instance in the broad philosophical attitude in which Fischer approaches his subject. The average text book on bacteriology considers the subject as entirely within the limits of medicine, and does not regard the recent advance in other realms of research of sufficient importance to merit more than a casual mention, if indeed that scant courtesy is given. No objection could be made to this if these manuals purported to treat of purely medical bacteriology, but in the general text book it would seem as if other lines of bacteriology should receive fuller treatment.

Fischer's new work, Vorlesungen über Bakterien, indicates that he considers his subject of sufficient importance to treat it in a broader manner than this. Not only does he include in his consideration a full treatment of the subject physiologically, but he adds to this an exposition of the comparative physiology of related functions in other groups of plant life.

Considerable attention is given the fermentative processes, not only in their chemical and scientific relations, but also in their practical applications as well. The rôle that bacteria play in the cyclical changes that matter undergoes in nature is well presented, but not all bacteriologists will accede to his conception of fermentation as limited to the decomposition processes that only occur among the carbohydrates.

The exposition here presented is thoroughly up-to-date. One sees for the first time in a text book the new theory in regard to the action of chemical disinfectants and their relation to electrolytic dissociation.

A leading and a valuable feature of the book is found in the admirably chosen list of bibliographical references with which the volume ends. The volume can be heartily recommended to students of this science who desire to keep in touch with the latest advances that are being made, and who also look upon the science of bacteriology as a science instead of a secondary adjunct to some other line of thought. *H. L. Russell.*

Lehrbuch der allgemeinen Chemie von Dr. Wilh. Ostwald, Professor an der Universität zu Leipzig. In zwei Bänden. Zweiten Bandes zweiter Theil: Verwandtschaftslehre. Zweite Lieferung. pp. 209—416. Verlag von Wilhelm Engelmann, Leipzig. 1897. M. 5.00.

The first Lieferung of part two of this volume was reviewed on p. 60 of this journal. According to an announcement by the publisher, the third fascicle is to appear at the close of this and the fourth and last fascicle in the course of next year. With it the discussion of the theory of affinity will be completed. Like the other parts of the work, part two of volume two is subdivided into books and these into chapters. The first fascicle was taken up almost completely by Book one, which treated of the history of this interesting theory from its crude inception to its modern mathematico-physico-chemical stage in the course of its evolution. Book two occupied a few pages in the first fascicle and runs through the second one recently issued, but does not come to an end on the last page of this fascicle. The first chapter treats of chemical kinetics and the second of chemical equilibrium.

Like everything that happens in nature, so every chemical process requires time to take place. This may be but the fraction of a second, or years, or even æons, according to the nature of the substances that act on each other, the medium in which the reaction takes place, the quantity of the substances in the unit of volume and finally according to the temperature. The laws according to which chemical reactions take place, have been studied in proper connection only at a comparatively recent date, although isolated attempts to study these laws have been made even in the last century. The author, after a brief introduction, takes up the results of individual workers in this field and discusses them in the detailed and thorough manner characteristic of his treatise. The consequence is that the treatise at times little resembles other treatises on chemistry, but rather has an appearance as though journal articles were liberally abstracted and the pieces more or less cemented together.

Chemical motion, however, does not take place in one direction only. Cases are known in which counter reactions take place, i. e. in which the initial substances can again be reproduced from the product resulting from the reaction. These were first regarded as exceptions, then the number of such instances has increased to such an extent that this state of affairs is now regarded as the rule. We have thus the theory of chemical equilibrium, the discussion of which is taken up in the second chapter which, however, does not come to an end with this fascicle. Even to those who do not possess a sufficient knowledge of mathematics to follow the author through all of his discussions, the book affords a mass of instructive reading matter. *E. K.*

Pharmaceutischer Kalender 1898. Mit Notizkalender zum täglichen Gebrauch nebst Hilfsmitteln für die pharmaceutische Praxis. Herausgegeben von Dr. H. Boettger und Dr. B. Fischer.

I. Theil. Kalendarium, Schreib- und Notizkalender, Hilfsmittel für die pharmaceutische Praxis. pp. 194.

II. Theil. Pharmaceutisches Jahrbuch. pp. CLIII, 181.

Siebenundzwanzigster Jahrgang (XXXVIII. Jahrg. d. Pharm. Kalenders f. Norddeutschland). Verlag von Julius Springer, Berlin. 1898.

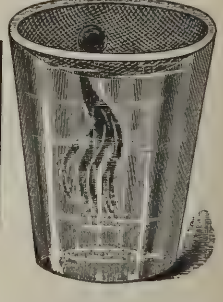
To those who have used the Pharmaceutischer Kalender in past years this annual needs no introduction. To those who have not known the convenience of such a book, the detailed title above will give some notion at least of the character and purposes of the two small volumes. Besides the diary portion of part one, it contains as usual a) Aids for the prescription counter, principally in the way of tables of detailed information with which it were useless to attempt to burden the memory; and b) Aids for the laboratory, also consisting largely of detailed information tabulated in the customary manner. This part, however, contains several additions to which attention should be called: 1) The most important methods of physiologic and hygienic analysis, such as the examination of woman's milk, of the contents of the stomach, of urine, of blood, and of sputum. 2) The principal methods of bacteriological examination. 3) The more common reagents used in physiological and bacteriological examinations. 4) The principal methods for the examination of foods and beverages. These additions will, no doubt, be greatly appreciated by those who have known the value of these manuals heretofore.

The bulk of Part II is of less interest to the American pharmacist, since most of the information contained therein, such as the pharmaceutical laws of the German empire, the pharmaceutical directory of the various states and provinces, etc., is specifically German. Incidentally even this information may be of value to American pharmacists who are interested in questions of pharmaceutical legislation. The introductory part, however, of this volume is scientific and therefore its interest is in no way restricted to graphical boundaries. Last year the Pharmaceutisches Jahrbuch contained an article by Dr. B. Fischer "On the central water supply of villages, institutions and individual buildings." This year's Yearbook contains a supplementary article by Dr. C. Mez on "How to judge waste-waters and how the waste-waters of cities and factories can be removed and purified." These articles are certainly timely and of considerable moment to the educated pharmacist who occupies more or less the position of a sanitary adviser, especially in smaller cities and villages. As long as America does not produce anything similar, these books will continue to be of annual interest to our pharmacists. *E. K.*

Time Contradicts a Mis-Statement.

RECENTLY the manufacturer of a PATENTED pill attempted to prove that mass pills "dry out" and "harden" with "age", and suggests that the Profession purchase hammers and blocks of wood to see how "hard" they (the pills they use) are. There is no statement why the use of WATER is not suggested to test the solubility of the pill. Thirty years ago we had made a mahogany case, velvet lined, and placed in it a number of bottles of different pills, (each bottle containing 100 pills). They were exhibited at different conventions, and last at the American Medical Convention, June 1–4, 1897. We have just completed a comparative test of fresh friable pills and mass pills (Warner & Co. above referred to) *30 years old*, and the mass pills are found to disintegrate first. We do not see how a pill can evaporate its moisture and become hard when it is first covered with sugar (or gelatin) and packed in glass bottles, securely corked. These pills, 30 years old were *not* "hard and dry". Upon breaking the coating the mass was in excellent condition, and after disintegrating, gave a solution devoid of small particles of the pill as was the case with the friable pill. These particles of the friable pills stay in the water indefinitely and do not break up, even when agitated

IF IT'S A PILL MADE BY W.R. WARNER & CO. IT'S SOLUBLE



We have yet to find a friable pill (Blaud) which gives the light greenish solution, indicative of the ferrous carbonate. Thus far our experiments have demonstrated them to consists of ferric oxide, a form of iron worthless in the conditions where a ferrous carbonate would be of great value.

We have always made a soluble pill. We have countless testimonials to this effect from Practitioners throughout the world, covering a period of 40 years. Dr. J. H. Adair, of Liberty, Ohio, writes us unsolicited, that he recently used some of our pills which he has had for 12 years, and that "they are as efficient as when made."

In the award granted by the Columbian Exposition, 1893, the following language is used:—"The pills are of uniform size, the coating is perfect and protects the pills indefinitely, samples 27 years old being shown readily soluble in hot or cold water."

WILLIAM R. WARNER & CO.

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SUPPLEMENT, JANUARY 1897.

Universities and Colleges.

Brussels Botanical Garden.

During several years past a collection of plants of the Congo district has been made and the specimens have been examined scientifically and classified. The botanist of the garden, M. Durand, has now published a list of plants from this territory which have not been described previously.

University of Wisconsin.

In addition to the required curriculum the School of Pharmacy offers two courses of special lectures of interest to the pharmaceutical student. A course on First aid to the injured with demonstrations is being given by Dr. L. R. Head. This will be followed next semester by a course on Law applied to pharmacy by Prof. C. N. Gregory, Associate Dean of the College of Law.

University of Arizona.

According to the Botanical Gazette a noticeable Cactus Garden has been established at the University of Arizona. It is the purpose to bring together eventually all the *Cactaceæ* indigenous to the United States, and already more than a hundred species are represented. The region could not be more favorable for such a purpose, and for the first time there will be large opportunity for studying the group in its natural environment.

The Burroughs Scholarship.

The Burroughs Scholarship is offered annually in July to pharmaceutical chemists who are desirous of obtaining advanced instruction in chemistry and pharmacy with a view of conducting original investigations in these subjects. The scholar receives the sum of 26 l. and is provided, free of cost, with a working-bench, apparatus and materials in the Research Laboratory. He is required to work under the supervision of the professor of chemistry.

California College of Pharmacy.

The trustees and faculty decided to change the term of the sessions from summer to winter. The summer term was adapted in 1873 principally because the trade in San Francisco is lightest in summer, thus enabling students to attend college while working in the stores; also because the season was considered better for the study of botany. The next term will open on the first of February, but thereafter the term will begin with the first of November.

University of Munich.

Attention is called to the fact that the relationship between the pharmaceutical institute under Prof. Hilger and the chemical institute under Prof. v. Bayer enables the pharmaceutical student to receive his introduction into chemistry under the professor of general chemistry and the instruction in pharm. chemistry by Prof. Hilger. It is said that no other German university has had such a division of labor and that the arrangement redounds to the credit of the government and university authorities. It may not be amiss to call attention to the fact that at least one American university has for some years had a similar if not the same arrangement.

An American Tropical Botanical Laboratory.

"In order to come in contact with the problems that are now pressing, the botanist must establish his laboratory in the midst of the normal conditions, and no condition is so vitally needed by botanical research, and so overwhelmingly lacking, as that furnished by the tropics. In consequence of this, the garden and the laboratories at Buitenzorg already have furnished opportunities for many important discoveries, and have become a sort of Mecca to the botanists of the world. But to an American botanist Java is a hemisphere away, and a visit to Buitenzorg is equal to a trip around the globe. A month is necessary for the journey each way, and the cost of it, including but a brief stay at the laboratory, is about twelve hundred dollars."

The editors of the Botanical Gazette as well as other botanists are therefore anxious to have a botanical laboratory established in the American tropics. Not only would a visit to such a laboratory require much less time and money, but at our very door there lies a vast domain practically unknown. It is estimated that a trial station might be maintained either on the eastern coast of Mexico or on one of the islands of the Carribbean Sea for the cost of $5000 for one year. After that the selection for a permanent station could be made. It is expected that cooperation of the different universities as well as private subscriptions will soon effect the realization of these plans.

Division of Botany, Dept. of Agriculture.

From a letter to the Botanical Gazette by Mr. F. V. Coville the following is noted as being of interest to the pharmacist. The Division of Botany, Dept. of Agriculture, has at present a force of twenty persons including clerks and laborers, and funds for expenditure amounting to $29,000 annually. The work of the Division includes investigations and statistics on native plant resources; geographical distribution of seeds; weeds; distribution damage and methods of checking; poisonous plants; anatomy. Mr. Coville is chief of the Division and Botanist. The work in pharmacology is in charge of Mr. V. K. Chestnut who is provided with laboratory facilities for his work and who is conducting experiments on poisonous plants, especially the native ones which are a common cause of poisoning in man or domestic animals.

The National Herbarium grew up under the control of the Division of Botany, but several years ago it became so extensive that the Division could no longer give it the care and protection it demanded. The responsibility for its care and housing has therefore recently been transferred to the Smithsonian Institution where it is now located. The botanist of the Division of Botany, Mr. Coville, serves without pay as curator. In addition to his services the herbarium is provided with the services of ten persons including three assistant curators. In its fire proof home the herbarium is now favorably located to continue its development.

Scientific Societies.

German Chemical Society.

This society intends to erect a monument in honor of the late Prof. August Kekulé. The monument is to be placed in front of the chemical institute in Bonn.

Pan-American Medical Congress.

The second Pan-American Medical Congress met in the City of Mexico, Nov. 16. The congress was presided over by Exprovost Pepper of the University of Pennsylvania. Pharmacy of this country was represented in two sections. Prof. Joseph P. Remington presided over the section on The Pan-American Pharmacopœia and Prof. Rusby over the section on South American Flora.

Belgian Pharmaceutical Society.

At its October meeting the Association Générale Pharmaceutique has determined to celebrate its fiftieth anniversary by arranging an international pharmaceutical congress.

Proceedings received:—

Zeitschrift für Naturwissenschaften, Organ des naturwissenschaftlichen Vereins für Sachsen und Thüringen. 69. Bd., 3./4. Heft. Herausgegeben von Dr. G. Brandes. Verlag von C. E. M. Pfeffer, Leipzig.

Proceedings of the Wisconsin Pharmaceutical Association. Sixteenth Annual Meeting, 1896. Together with the fourteenth annual report of the Wisconsin State Board of Pharmacy. Brochure, pp. 78 and 64.

In Memoriam.

Du Bois-Reymond.

The news of the death of the famous Berlin professor has just been received. Emil Heinrich Du Bois-Reymond was born in Berlin November 7, 1818. In 1837 he began the study of philosophy and theology, but soon went over to the study of the natural sciences. He studied geology in Bonn in 1838, then physics and mathematics in Berlin, and in 1839 took up the study of medicine. Later, as a member of the Berlin faculty, he developed the large and world famed physiological institute. As secretary of the Academy and as rector of the University he had frequent occasions to deliver public lectures, through which he became popularly so well known.

Personals.

Prof. Max v. Pettenkofer has been reappointed president of the Bavarian Academy of Sciences for three years by the Prince-Regent. Not long ago he resigned from the office of kgl. Leib- and Hofapotheker after having previously given up his professorship in hygiene at the university. Pettenkofer held the office of Hofapotheker since 1850, having inherited it, as it were, from his uncle. This was possible because he had passed the state board examination in pharmacy as well as in medicine.

Prof. Robert Koch has left Berlin on a leave of absence to investigate the Rinderpest in South Africa at the invitation of the Cape Colony Government. While in England, on his way to Africa, his reception is said to have been exceedingly cool, which has not at all pleased the Germans.

In recognition of the long services for pharmaceutical education the former pupils of Prof. Attfield intend to honor their teacher with a testimonial of their appreciation. A committee has been formed to receive subscriptions.

Bibliography.

Volume three of Principles and Practice of Agricultural Analysis, by H. W. Wiley and published by the Chemical Publishing Co. is now ready.

During the coming year the Berichte of the German Chemical Society will contain only the original contributions and the proceedings of the society. As announced more than half a year ago the volume of abstracts will be combined with the Chemisches Centralblatt. Americans will hereafter receive the Berichte for M. 25.00. The first semester of the Centralblatt can be had for M. 14.00. It is hoped that the number of subscribers to the Centralblatt will be sufficiently large to allow a reduction in price for the second half year.

The second half of the German translation of the monumental work by Icilio Guareschi on nitrogenous organic substances with special reference to alkaloids and ptomaïnes is complete in manuscript and will be published by Hermann Heyfelder early this year. The German edition is by Dr. Hermann Kunz-Krause of the University of Lausanne.

The second part of the second volume of the revised second edition of Ostwald's Lehrbuch der allgemeinen Chemie is to appear in the course of this year as announced by Wm. Engelmann of Leipzig. The "Schlusslieferung" of Griesbach's Physikalisch-chemische Propædeutik by the same publisher is to appear early this year.

The Torrey Botanical Club offers a complete set of five volumes of its memoirs at half price. The money thus obtained is to be used for reprinting those numbers of the Bulletin which are out of print and for which there has been considerable demand.

Catalogues received:—

A. Hartleben—Wien. Illustrirter Katalog.

Martin Boas—Berlin. Katalog No. 29 des Med. Antiquariats.

Jacques Lechevalier—Paris. Catalogue trimestriel de livres anciens et modernes: Botanique.

J.—B. Baillière et Fils—Paris. Botanique.

Commercial.

The publications by Prof. Maragliano which have appeared in a number of medical journals of Europe have created considerable interest in his treatment of pulmonary tuberculosis. The New York Medical Journal of August 15th, in a lengthy editorial, comments favorably on Maragliano's serum treatment.

Maragliano's serum is now undergoing clinical tests in a number of our institutions. First supplies of the remedy have come into the hands of Messrs. Lehn & Fink, 128 William St., New York City, who supply it in original vials containing 5 ccm.

The quantity of mercury exported by the mines of the firm of Auerbach & Co. at Nikotooka, in the government of Ekaterinoslav, in the course of the last year amounted to 10,706 bottles, which went to various European countries, China, India, and to the Transvaal. For consumption in Russia itself 1,596 bottles were sold. The output is said to be steadily increasing.

The English chamber of commerce in Alexandria has urged the adoption of the metric system of weights and measures by Egypt. The reason for this petition lies in the conviction that British commerce would profit greatly by such a step, because the natives cannot understand the tenacity with which Great Britain clings to its antiquated systems. Egyptian merchants shun transactions with the English merchant because of the inconvenience of conversion of weights and measures, whenever competitors use the more convenient decimal system.

The Bulletin Commercial states that, according to American statistics, the production of caoutchouc in the province of Para (Brazil), which is constantly on the increase, has doubled in the last twelve years and quintupled in the last thirty years. The production of 1895 was 13.4 percent greater than that of 1894, and 10.2 percent greater than that of 1893. The following statement shows the value of the exports in certain years:—

Years.	Value.
1865	£ 8,243,000
1870	10,528,000
1875	15,144,000
1880	18,889,000
1885	29,310,000
1890	36,300,000
1895	46,363,000

The imports of caoutchouc into the United States have increased in about the same proportion as the exports from Brazil, but in 1895, for the first time, the amount of caoutchouc sent from Para to Europe was greater than that sent to the United States. The increase is especially noticeable in England, France and Germany where this product is in great demand.

Untaxed Alcohol for the Manufactures and Arts.

The joint select committee, created at the last session of congress, to investigate and report upon the question of the use of alcohol free of tax in the manufactures and arts, have prepared a series of interrogatories, which will be distributed throughout the country to such parties as are thought to be interested in the question.

The report of Mr. Henry Dalley, Jr., who was commissioned to investigate the workings of foreign laws governing the use of untaxed alcohol in the manufactures and arts has been submitted, and contains very full and extremely valuable data covering Great Britain, Germany, France, Belgium and Switzerland.

It is the earnest desire of the committee to secure all possible information bearing upon the subject, and it is hoped that parties interested will submit their views to the committee promptly. Sets of the circular letter and blank for replies will be supplied to any applicant by addressing the chairman, Room 21, Senate Annex, Washington, D. C.

The committee, which is composed of three members of each House, intended to assemble in Washington soon after the middle of November for the purpose of formulating a report to congress accompanied by the draft of a law which will place domestic industries on as favorable a basis as similar industries in foreign countries. During their sessions in Washington hearings will probably be given in order to supplement the information obtained through the interrogatories above set forth. Due notice of the time of such hearings will be given to the public.

Cultivation of Ipecacuanha in Straits Settlements.

In Mr. Cantley's Report on the Forest Department of the Straits Settlements for 1886 (quoted in the *Kew Bulletin*, 1888, p. 127—128) it is stated that "ipecacuanha seems to grow in the Straits with all the luxuriance of its native country. I visited," says Mr. Cantley, "a plantation in Johore and saw thousands of plants in excellent health. They were protected from the sun by palm leaves laid side by side on artificial supports about six feet high; hedges of the same were put down a few yards apart." It is possible that this plantation was the source of ipecacuanha which found its way into the London market at the latter end of 1887. This was, according to the *Kew Bulletin*, the first commercial sample of the drug produced in the Old World. A report upon its examination was given by Mr. Francis Ransom in the *Pharmaceutical Journal*, 1887, p. 400. It was stated that this cultivated article was "quite equal to the average Brazilian roots." Since that time very little has been heard of this interesting cultivation. We find, however, that it is still in existence, for Mr. H. N. Ridley, Director of the Gardens and Forest Department in the Straits Settlements makes the following mention of it in his Agricultural Bulletin (No. 4, 1895). "The ipecacuanha of the Renquang estate appears to maintain its high reputation if we may judge by the home market reports, where good quality of Cartagena was at 4 s. 6 d. per lb. and fair stout Brazilian at 5 s. 9 d., the owner refused 6 s. per lb. for the Johore root." [Pharm. Journ. Nov. 7, 1896, p. 408.]

A New False Kola.

There has lately appeared in the London and Liverpool markets a false kola which has proved somewhat difficult to locate botanically. The so-called kola is in a perfectly dried and hard state. Some pieces are of a dull, dark brown and others are of a reddish-brown color. The smaller pieces appear to have been cut across when fresh and to have shrunk in the process of drying; this when mixed with the cotyledons of the true kola would be scarcely distinct enough to be detected, but in the parcels are some entire seeds which measure about 3 in. long, 2 in. wide, and 1½ in. thick. They are oval in shape, and are much contracted in the center at the point where the hilum is situated, so that the ends being brought together, the point of attachment to the pod is completely hidden. The seed cuts with a firm texture, it has no smell, little or no taste. It is easily divided into two cotyledons and its general character is leguminous. In its shape it agrees very closely with that of the mora—*Dimorphandra Mora*, better known, perhaps, as *Mora excelsa*—a large timber-tree of British Guiana, growing to some 100 to 150 feet high, with a trunk diameter of 2 to 2½ feet. The tree is valued in British Guiana for its durable, hard wood, and the large seeds are eaten by the natives in times of scarcity; they are also used in diarrhoea and dysentery. The seeds of the mora and the large seeds now known as false kola are no doubt closely allied, if not actually identical. The mora has a single-seeded pod, and the appearance of the new seed is that of a single occupant of the outer coatings. That this character is without variation, however, seems doubtful. The species of *Dimorphandra* are mostly natives of Brazil, and it is possible that the seed now in question may belong to one which is not known in this country (England). It may be worth mentioning that the largest seed known in the vegetable kingdom is that of *Dimorphandra oleifera*, one specimen measuring 14 in. in circumference and 6 in. at its greatest width. This comes from Panama and contains oil which is said to be better than linseed oil for mixing with paint, for which purpose it is used in Panama.

[Chemist and Druggist, 49, p. 826.]

Spearmint Oil.

All interest seems to have been lost in Thuringia in the destillation of this oil; the production of this year will hardly amount to more than a few hundred kilos. The world's markets are supplied by North America and especially by the states of New York and Michigan, where the cultivation of spearmint is carried on side by side with that of peppermint. The average production per year is estimated at 12,000 lbs. This year's yield of oil is said to be a normal one so that the prices will remain unchanged.

Our New York Laboratory reports as follows:

"The spearmint plants cultivated in the immediate neighborhood of our Garfield establishment were of excellent growth and were distilled as soon as the flowers appeared. We obtained 0.3 p. c. of oil from the fresh plants. Its specific gravity is 0.980, being considerably higher than that of the ordinary oils of commerce (0.920—0.940); the optical rotation is —42° 32′. The flavor of the oil differs entirely from that of the commercial oils and is not at all like that of mint or pennyroyal, but rather like that of carvol. We observed, by the way, that when the oil separates from the water at the distillation, a considerable quantity of oil heavier than water is obtained. Perhaps this part of the essential oil is, for want of proper care, not collected along with the lighter oil in the distillation and this fact may account for the low specific gravity of most commercial spearmint oils."

[Ber. Schimmel & Co., Oct. '96.]

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to make extemporaneously and economically Syrup Hydriodic Acid, U. S. P. This method obviates the loss, annoyance and delay in filling prescriptions for Syrup Hydriodic Acid, as the pharmacist does not need to carry a stock made up, which is very liable to be unfit for use when wanted, owing to the liberation of iodine and the discoloration caused by the formation of caramel, for he can make up just as much as the prescription calls for and thus dispense a superior, sightly and always reliable product of any desired strength. Our Conc. Solution of Hydriodic Acid, 10%

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SUPPLEMENT, FEBRUARY 1897.

Educational and Scientific Institutions.

New York Botanical Garden.

Number two of the Bull. of the N. Y. Bot. Garden has made its appearance. This number contains reports on the plans of the garden, museums, etc., also a large map which conveys to the reader something of the extent and manifold character of the new garden. Throughout the country the progress of this garden will be watched with interest.

Hungarian Universities.

The Hungarian Apothecaries Society has petitioned the minister of instruction to establish professorships in "pharmaceutical technique" or "practical pharmacy" at the Hungarian universities.

Attention is called to the fact that even under the most favorable circumstances the pharmaceutical apprenticeship is defective even in this particular and that at present the Hungarian like the German universities give no attention to this subject although the state boards demand a practical examination.

Pasteur Institute.

It is reported that the widow of Baron Maurice Hirsch, of Vienna, has resolved to present two million francs to the Pasteur Institute as a memorial of her husband. This will enable the building to be enlarged by chemical and biological laboratories, which, it is estimated will cost about 800,000 francs. Some of the professors, moreover, at present receive little or no salary. The gift, therefore, comes at a very appropriate time, and it could not have been bestowed upon a worthier object, nor could a better memorial be found, than the Pasteur Institute.

University of Bonn.

Dr. Theodore Curtius, Prof. of Chemistry of Kiel, is to succeed Kekulé at Bonn. Curtius was born at Duisburg in 1857. He studied at Leipzig under Kolbe and at Heidelberg under Bunsen, taking his doctor's degree in 1882. He then became assistant to Baeyer at Munich, private docent at Erlangen in 1886 and professor at Kiel in 1889. Curtius is chiefly known by his researches on the diazo and diazoamido compounds of the fatty series, which led first to the discovery of diazoacetic acid and subsequently to the production of hydrazine. The discovery of hydrazoic or hydronitric acid, N_3H, was another result of Curtius' researches which exited very general interest among chemists.

Davy-Faraday Research Laboratory.

On Tuesday, Dec. 22, the Prince of Wales opened the Research Laboratory which has been founded in connection with the Royal Institution, Albemarle Str., London, W., by Dr. Ludwig Mond, who according to the C. & D. has spent 100,000 l. upon the gift, 62,000 l. of which has been invested as an endowment. The house provides sixteen rooms for working purposes, a number of which have been illustrated and described in a recent number of the Pharmaceutical Journal. As previously announced (vol. 14, p. 33), Lord Rayleigh and Prof. Dewar are to act as directors without emolument and Dr. Scott will act as superintendent. In his address Dr. Mond referred to the foundation of the Royal College of Science by the Prince Consort, which was the first part of a scheme, the second of which was to be one of research. It was intended that the whole should be attached to the Royal Institution, but that was found to be impossible. Some years after Dr. Mond had resolved to found such a research laboratory as the present one he ascertained the above facts, and he determined to make it in every way worthy of the illustrious men after whom it was named, and to meet in some measure the intentions of the Prince Consort.

A Department of Science.

Few persons have any idea of the extent and importance of the work the government is doing for the development of the resources of the country and the promotion of its industries. In an article in Science for Jan. 15, Charles W. Dabney, Jr., assistant secretary of agriculture, publishes a summary argument for its consolidation into one department. He shows that, omitting all those charged with purely executive business, the government schools, and the testing laboratories of the War and Navy departments, the United States maintains twenty-eight scientific bureaus for developing our resources and advancing industry, at a cost of nearly $8,000,000 annually. They employ over 5,000 persons, in the entire country.

These bureaus are engaged in doing all kinds of scientific work, from determining the movements of the heavenly bodies to studying insects and bacteria. There are bureaus for studying the earth and its products, the atmosphere and its changes, economic plants and their culture, domestic animals and their kind. There are surveys for measuring the land of the country and sounding its waters; bureaus for investigating many economic problems, and statistical agencies for collecting, compiling, and discussing the results of many industries. There are agricultural experiment stations for developing the products of the land, and a Fish commission for increasing and improving the life of our waters. Other bureaus teach us how to protect our forests, or how to save the forage resources of our Western plains; still others promote fruit culture or teach the farmer how to protect their crops and fruits from injurious insects or disease. Finally, the nation possesses great museums for collecting, preserving and exhibiting all objects of art, ethnology, natural history, mineralogy, geology, the resources of our country and the products of our people's work.

The government has, for an example, three separate and distinct agencies for measuring the land of the country, connected with two different departments; four seperate hydrographic offices for sounding the waters of bays, rivers, lakes, etc., in four different departments; and five separate chemical laboratories in the city of Washington alone. The statistics of the natural resources and products of the country are collected by eight different agencies connected with six different departments and bureaus, not counting the Census, which usually goes over the whole field again. This is doubtless one reason why government statistics are so often discredited by business men.

Mr. Dabney like most scientists thinks that what is needed is a general coördination of the scientific work of the government, and that the only way to accomplish this is by first bringing all of these bureaus together under one executive head. When this has been done the reorganization would take place naturally and easily, without injury to any of the good work now going on.

British Examinations.

Commenting on the English examinations the Pharmaceutical Journal makes the following statement: "The Major examination reports, published this week, are decidedly discouraging, even if contrasted only with the poor average that has prevailed generally of late years. Thus the percentages of rejections for the past three years have been: — 1894, 49 66; 1895, 53.42; and 1896, 53.07, these figures being higher than might reasonably be looked for among persons who have passed through such a severe ordeal as the Minor examination now undoubtedly is. On the present occasion, however, the percentage of rejections at the Major examinations have reached 57.14, a figure which cannot be viewed with equanimity by anyone having the best interests of British pharmacy at heart. These things are managed much better on the continent, where the percentage of failures does not exceed 5.0 p. c., if it reaches that figure, and the only inference that can be drawn is that there must be a grave defect in the British system — either of education or examination. Perhaps, on the whole, it is safe to say that our examination standard appears to be far above the head of the average candidate, and there is little reason to doubt that the cause is defective education and a consequent unfitness for the position the pharmacist of to-day may reasonably expect to occupy."

Scientific Societies.

German Pharmaceutical Society.

The German Pharmaceutical Society, which is not to be identified with the German Apothecaries Society, has completed its sixth year. Whereas the latter gives its time primarily to professional and commercial questions, the former is strictly a scientific society. For this reason it is naturally more limited in its numbers, but its membership, not confined to Germany, has reached four hundred and twenty. Besides holding regular sessions in Berlin the society publishes its proceedings, the Berichte d. d. pharm. Gesellsch., and during the past year has also started a pharmacognostical central station with which is coupled the publication known as the Bericht über die pharmakognostische Literatur aller Länder. In every respect the society may be said to be in a flourishing condition. Dr. Thoms of the University of Berlin, the president since the organization of the society, declined reelection and Mr. Finzelberg, the former vice-president, was elected in his place. Dr. P. Siedler was reelected secretary.

Personals.

Prof. Charles F. Chandler has retired from the professsorhip of chemistry and medical jurisprudence in the College of Physicians and Surgeons, but retains the professorship of chemistry in Columbia University.

After persistent endeavors of the friends of Charles Ledger, the discoverer of *Calisaya Ledgeriana*, have at last succeded in obtaining a pension from the Dutch government for this aged pioneer.

Prof. Paul Jacobson, known best as joint author with Prof. Victor Meyer of a textbook of organic chemistry, has left Heidelberg and is about to habilitate at the University of Berlin. His election to the position of General Secretary of the German Chemical Society has made necessary this change of residence.

Dr. C. A. Chatin, the new President of the French Academy of Sciences is pharmacist as well as physician. He was born at Tullens in 1813. According to the C. & D. he filled the part of pharmacist at two Paris hospitals, but is best known for his studies on the comparative anatomy of plants. He entered the Paris School of Pharmacy as Professor of Botany, and became Director in 1874. For twelve years he has filled this post. On account of his thoroughness and severity be became so unpopular that the school had to be closed. He then retired. It is said to be due to his zeal that the Paris School was removed from the historic place in the rue de l'Arbalête to its present handsome quarters.

On Dec. 30, Prof. Oscar Liebreich celebrated his twenty-fifth anniversary as professor. According to the Apoth. Ztg. he was born Feb. 14, 1839 in Koenigsberg, Prussia. He at first went to sea but later took up the study of chemistry under Fresenius in Wiesbaden and became technical chemist. Then he went over to medicine, graduated in 1865 in Berlin and two years later became Virchow's assistant in the pathological institute of the Charité. In 1868 he became docent and in 1871 extraordinary professor. In 1872, after the death of Mitscherlich he became director of the pharmacological institute, a position which he still holds. With his first assistant, Prof. Langgard, he published a Compendium der Arzneimittellehre. He is also editor of the excellent Therapeutische Monatshefte published by Springer and is at present engaged in the task of editing an encyclopaedia of therapy. Among pharmacists Liebreich is known for having introduced chloralhydrate as a hypnotic and wool fat into modern materia medica.

History.

Hindu Medicine.

One of the January numbers of *Nature* contains a review of a short history of Aryan medical science, a book of 280 pages and 10 plates written by H. H. Sir *Bhagoat Sinh Jee*, Thakore Saheb of Gondal and possessor of numerous titles, and published by Macmillan & Co., Ltd., of London.

"The author, an Indian prince, after studying medicine with diligence and distinction in this country, applied himself on his return to India to a study of the ancient medical science of Hindustan. As a result, he presents in this treatise a bird's-eye view of the marvellous civilization of India, and he does so from the point of view of a Hindu, in a spirit of faith and optimism creditable to his piety and patriotism. Perhaps a larger exercise of the critical faculty might have been more acceptable to Western intelligence, especially as, in some matters of history and chronology, the author is at issue with European authorities; but it might have spoiled the picture, which is simple and bright. The writer prefaces his account of Indian medical science by a brief sketch of the early civilization of the Hindus and of their religion, philosophy, science and art. The science and art of medicine where an important feature in this great system, elaborated according to the same principles and by the same methods as other branches of knowledge, and therefore possessing the same merits and the same faults. 'The Hindus believe, the author tells us, that like all their sciences, the science of medicine has been revealed to them.'

"The bible of medicine is the "Ayur Veda", whose authorship is attributed to no less personage than Brahma. Subsequent commentators, chief among them Charaka and Sushruta, have reproduced and somewhat amplified this record. The author, with great insight and judgement gives an interesting history and epitome of the doctrines and practices laid down in these works, of which he appends a list of 107. We observe that he has not included among these the 'Navanitaha', an ancient Sanskrit medical manuscript found by Captain Bower at Kuchar, in Eastern Turkestan, in 1890, and which is believed to be older than the works of Charaka and Sushruta. The development of science by the wise men of the East was a mixture of observation and contemplation. Their observation was keen though somewhat crude, but when the results were submitted to the process of intellectual digestion, an excessive addition to analysing and systematysing proproduced a code of knowledge into which imagination largely entered, and which was specious and unsound. The product, posessing the character and sanction of a revelation, became straightway a fixed guide, which has remained authorative and unaltered through the ages. The early medical observers scrutinized closely the structure and functions of the human body, and not content with noting and recording these, they must fully and finally explain them. For this purpose they invented three principles or essences or spirits — vata, pitta, and kafa — wind, bile and phlegm, which acting upon and through the constituent parts of the body, gave rise to all the manifold physiological manifestations of the organism. Disease was held to arise from excess, defect or disorder of one or more of these humors, and the object of the physician in examining the patient, was to detect which humour or humours were at fault, and select the remedy calculated to restrain, stimulate, or correct the aberrant flood. A doctrine of temperaments was built on the same basis. Associated with these hypothetical spirits, other supernatural agencies were postulated; faults committed in a former state of existance, and the operations of demons, where included among disease causes. It is not surprising, therefore, that rites, ceremonies, amulets, omens, and charms entered largely into treatment. The Thahore Saheb advances strong claims for the antiquity and excellence of Indian medicine. He contends that the medical science of the Greeks, Egyptians and Arabians, was extensively borrowed from India. He asserts that Jenner and Pasteur were anticipated in the matter of protective inoculation, Morton and Simpson in anaesthesia, Laennec in auscultation, Piarry in percussion, and Lister in antiseptics by Indian sages; that the vaunted discovery of Harvey was also presaged, if not preceded, by Indian doctrines regarding the circulation of the blood. He shows that modern medicine has derived important practices, such as massage, and many useful drugs from India, and even goes the length, in apologizing for the short-comings of Indian surgery, of asserting that in ancient times the use of drugs prevented or dispersed tumours, and other conditions now demanding surgical intervention. He expounds at some length the rules of hygiene and disease prevention laid down by the rishis. They are mostly personal, and their elaboration is astonishing. Life to the orthodox Hindu was a series of minute rites governing every item of daily existence — some salutary, but most of them frivolous.

Still, with all its absurdities, Indian medicine was a triumph of acumen and industry, and the author has succeeded in placing a very clear and complete compendium of it on record in this book, which he who runs may read. Perhaps his hope that rational and progressive medical science may still be able to learn something from Aryan medical science is a feasible one; but the materials and methods of the latter must to that end be recast in the furnace of modern inductive research.

Bibliography.

The New York Medical Record, published by William Wood & Co., has comleted its fiftieth volume.

Harper's Magazine for January contains an illustrated series of articles on the progress of science during the century, by Dr. Henry Smith Williams.

Die chemische Untersuchung und Beurtheilung des Weines by Dr. Karl Windisch is announced as just out by Julius Springer of Berlin.

Ginn & Co. announce the completion of a new laboratory manual for technical schools, high-schools and colleges. The author is Dr. Frank H. Thorp, instructor in industrial chemistry in the Mass. Inst. of Technology.

Stearns' calendar for 1897 is decorated with a reproduction, according to the three color process, of Carl Goebel's painting "The Duet". The original in possession of Mr. F. K. Stearns has given him and his friends great pleasure. In the reproduction it can now be enjoyed by many.

Die Umschau, a new journal, which is to supply a general oversight over the progress made in the sciences, technology, literature and art will be edited by O. A. Wolters and published by H. Bechold, Frankfurt a. M. Pharmacy is represented by G. Arends, one of the editors of the Pharmaceutische Zeitung of Berlin, who will contribute an article on old and new remedies in one of the early numbers of the journal.

The *Botanical Gazette* has again added to its list of editors. The names of nine foreign associate editors, representing seven European countries and Japan have been added to those of the four American associate editors announced with the change of the journal some months ago. Pharmacy is represented by Dr. Leon Guignard, Professor of Botany a the École supérieure de Pharmacie of Paris. It is expected that this association will result in a larger recognition of American botanical work, the lack of which has more than once been pointed out in the Gazette.

Commercial.

Otto of Roses.

Mr. Vice-Consul Wratislaw, reporting on the trade of Eastern Roumelia, says it is probable that more land will be put under rose cultivation as the production of grain becomes less and less remunerative. But it is highly necessary that government or other supervision should be instituted in order to insure the purity of the otto exported, or European buyers would fight shy of the Bulgarian article. "Pure" otto was offered last year by certain firms at Kazanlik and Karlovo for 1200 fr. per kilo., about 200 fr. less than what producers asked merchants for the unadulterated article.

Cultivation of Medicinal Herbs and Plants.

The cousular report for November on the Agriculture of the District of Batoum states that an enterprising gentleman came from Russia Proper about a year ago for the purpose of carrying out experiments in the cultivation of medicinal herbs and plants in the Caucasus, and at the same time to procure volatile oils. Pending the receipt of the required permission from the Government for carrying out his proposed undertaking, he made researches in every direction for this class of plants, and his labor, according to the Caucasian agricultural newspaper, has been crowned with great success, he having discovered a large variety of herbs which possess important healing properties, the result being that he has received large orders from many Russian firms of druggists. With a view to encouraging the cultivation of the castor-oil plant, the Imperial Bank has been authorised to make advances, at all its branches, on the seed of this plant.

According to the C. & D. enormous shipments of cinchona bark have taken place from Java during the month of December last. The following figures indicate the total exports of the last four years.

	1896.	1895.	1894.	1893.
Dec. Amst., lbs.,	890,000	634,000	531,000	391,000
Whole year, "	10,079,000	8,827,000	8,917,000	7,342,000

According to the Drogisten Zeitung Bohemia has only 118 apothecary shops, but in addition over 200 drug stores. Prag with 201,400 inhabitants (excl. suburbs) has 19 first-class pharmacies and not less than 50 second-class stores. With such a number of drug stores the limitation of pharmacies can be but little protection to the pharmacist.

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SUPPLEMENT, MARCH 1897.

Educational and Scientific Institutions.

University of Munich.

Prof. A. Hilger, Director of the Pharmaceutical Institute and Laboratory for Applied Chemistry, describes with the use of plans the new laboratories in No. 11 of the Apotheker Zeitung. Attention was called to the peculiar relation between this institute and the Chemical Institute under Prof. v. Baeyer in the Jan. number of this journal.

A National University.

Last month attention was called to a movement on foot to create a Department of Science at Washington, so that the large amount of scientific research being done by the various bureaus of the national government might be guided by one scientific head. (p. 5.)

The editor of Science, in a recent issue, tries to show how the centralization along somewhat different lines might ultimately result in a national university. "The reconstruction of the University of Paris, the efforts in and out of the British Parliament to make a University of London, the great success of the University of Berlin, and the renewed advocacy of a National University at Washington, indicate a movement which, we believe, makes for the progress of education and science. There are dangers in centralization, but these are small in comparison with the promise of great centers, where specialization and cooperation can be carried forward to the degree demanded by the present state of learning and science."

The writer claims that the common school education is primarily for the benefit of the individual, whereas the higher education is chiefly for the benefit of the state. "All the money spent on universities since the first beginnings at Paris and Salerno has been paid back by the results of the education of one man such as Faraday or Pasteur." He also thinks that "a university supported directly by the people would have peculiar influence and special dignity." He points out that practical politics have entered neither West Point nor the Smithsonian Institution; that the "growth of the University of Berlin has not weakened the other German universities."

However, rather than to advocate the immediate establishment of a great national university, the writer rather hopes "for a gradual growth of the national institutions already at Washington."

"We have there great libraries, museums and laboratories, able investigators engaged in advancing pure and applied science, and younger men learning from them the methods of research. These are the essentials of a university. No university in the world includes so many or such able investigators, teachers and students of geology as the U. S. Geological Survey, and in many departments the work at Washington surpasses any American university in the amount of investigation accomplished and in the number of investigators trained. . . . . . We believe that, without radical changes and with nominal expense, there could be established at Washington a national university likely to become the world's greatest university."

Pharmacognosy and the U. S. Div. of Botany.

The Botanist of the U. S. Department of Agriculture in his annual report makes the following statement with reference to poisonous plants.

The work of the past year has been devoted largely to the development and extension of certain fundamental requirements, the increase of the library and reference collection of drugs, the broadening of the correspondence on poisonous plants, and the extension of the card index on this subject. This last work was pursued with the double object of facilitating the answering of current letters of inquiry and the acquisition of material for the ultimate publication of a manual on the poisonous plants of the United States. Over 1000 cards have already been collected from the scientific and popular literature of botany, chemistry, physiology and toxicology.

Special attention has been paid bibliographically to the collection of data in regard to the poisonous species of two families of plants, the *Ericaceæ* and the *Anacardiaceæ*. Information regarding the former has also been augmented through correspondence and by experimentation. An extended report has been prepared, but the work of investigation is not yet complete. The results obtained up to date show that a chemical antidote has been found for andromedotoxin, the poisonous constituent of poison laurel (*Kalmia latifolia*) and other plants of the family *Ericaceæ*. The utility of this antidote has thus far been shown only in the laboratory by chemical experiments and by experiments on guinea pigs; but its usefulness with larger animals, especially those like cattle and sheep, which live on bulky foods, is yet to be demonstrated.

The experimental work on the *Anacardiaceæ*, the family to which poison ivy (*Rhus radicans*) belongs, was confined to a verification of the results of other recent investigators on the properties of the poisonous principle, toxicodendrol. Large quantities of toxicodendrol were also shown to exist in *Rhus potentillæfolia*, a species of poison oak lately rediscovered in Mexico.

Two toxicological experiments were tried with extracts from a native species of flax (*Linum rigidum*), which we are informed is killing sheep in Texas. The results were affirmative, although the plant has not been generally recognized as poisonous.

Cases of poisoning involving over a dozen plants in other families have been presented by correspondents for consideration and advice. Four of these caused nearly fatal catastrophes to nine individuals; the others were fatal to animals. Four groups of species are especially interesting on account of the extent of the damage they inflict. These are the loco weeds (*Spiesia* and *Astragalus*), the poison laurels (*Kalmia*, *Rhododendron*, and *Azalea*), the larkspur (*Delphinium*), and the sneeze weed (*Helenium autumnale*). All are reported to be killing cattle by the hundreds. *Cicuta vagans*, a little-known plant related to poison hemlock, is also killing many cattle in northern California, Oregon and Washington. All these plants need careful investigation.

Scientific Societies.

Toronto Meeting of the British Association.

A. B. Macallum in Science calls attention at this early date to the extensive preparations that have been made for the meeting of B. A. A. S. at Toronto, Canada, commencing Wednesday, Aug. 18. The finance committee have been promised $27,500 to meet the expenses of the occasion. The sectional meetings are to take place in the buildings of the University of Toronto, which are centrally situated and which may be reached from all points of the city by means of the electric car system. As the University grounds are adjacent to the Queen's park and the residential portion of the city, this arrangement will thus be a most agreeable one for visitors. The presidential addresses and the evening lectures will be delivered in Massey Hall, which has been recently erected and is capable of holding about four thousand auditors.

The retiring President is Lord Lister, Lord of the Royal Society. The President-elect is Sir John Evans, K. C. B., Treasurer of the Royal Society, who will deliver the presidential address on the evening of the opening day.

It is desired to make the gathering largely an international one. The fellows and members of the A. A. A. S., which meets at Detroit, and is expected to visit Toronto, will be granted membership for this meeting upon payment of $5.00. From forty to fifty continental Europeans are also expected. This gathering, it is hoped, will do much to realize the hopes of those who advocate the formation of an International Association for the Advancement of Science.

American Pharmaceutical Association.

The Committee on scientific papers for the Minnetonka meeting of the Am. Pharm. Assn. offers the following list of queries as a stimulus to those who want suggestions. The Committee, however, wants it clearly understood that nobody need confine himself to any of the topics suggested.

1. A comparative examination of the various methods for solutions of formaldehyde is desirable.
2. Is mercuric chloride formed in tablets of calomel on standing? Examine (quantitatively) various commercial samples.
3. Does the addition of linalool acetate to oil of bergamot exert any uniform influence on the results of assay?
4. A convenient method of assay for oil of cinnamon is desired; it is claimed that the "sulphite" method is unsatisfactory.
5. What is the alkaloidal strength of the various specimens of "Norwood's Tincture" found in the market.
6. Comparative assays of the various commercial brands of iodoform and sublimate gauze are desirable.
7. To what extent is powdered acacia adulterated with dextrine?
8. Commercial litharge is grossly adulterated; what are the adulterants, and in what proportion are they present?
9. An inquiry into the nature and composition of "Morrhuol" is desired.
10. *Witch-hazel Water.* Is it desirable to make witch-hazel water (generally termed witch-hazel extract) official? Does it contain formalin? What percentage of alcohol should it contain?
11. Under what conditions can the diastasic power of malt preparations be preserved?
12. Is the use of suppository machines advisable for general prescription work?
13. A process for a fluid extract of wild cherry miscible with water is desired.
14. What is the character and quantity of fixed oil in pareira brava?
15. It has been stated that samples of potassium actate have an alliaceous odor. To what is that due?
16. What is the influence of a low temperature in percolation?
17. Would it be practical or advisable for pharmacists to undertake the dispensing of a sterilized and adapted (humanized) milk for infants? What process would be most advisable for this?
18. Is glucose or grape sugar of any value as a preservative in syrups of hydriodic acid and syrup of ferrous iodide?
19. What is the influence of filtration on solutions?
20. Salol is often ordered in powdered form. How can pure powdered salol be easily prepared?
21. Rubber substitutes. It is claimed that articles under this name are largely used by manufaturers as admixtures to Para rubber, being prepared of sulphur or chloride of sulphur and vegetable or animal oils, glycerin and turpentine. Investigation invited.
22. Acetone alcohol. An article under this name has been introduced as a substitute for ethyl alcohol. What is it, and how is it made?
23. It is claimed that the deep green color of some extracts and fluid extracts in the market is traceable to copper vessels used in their manufacture. Investigation invited.
24. Precipitated sulphur seems to be grossly adulterated. Is it possible to obtain it pure in the open market?
25. To what extent is selenium found in "flowers of sulphur?"

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Personals.

Prof. Victor Meyer of Heidelberg has been elected President of the German Chemical Society.

Mr. C. G. Lloyd, botanical editor of Drugs and Medicines of North America, has recently returned from a month's trip through Florida collecting fungi.

Prof. H. H. Rusby, formerly Recording Secretary of the Torrey Botanical Club, has been elected one of the Vice-Presidents of that society.

Dr. Beckmann, Professor of Pharmacy and Applied Chemistry at the University of Erlangen, will return to the University of Leipzig, where he formerly was Privatdocent in Ostwald's Laboratory.

Dr. R. Kobert, who has for ten years occupied the position of Professor of Pharmacology at the University of Dorpat, has resigned his chair in order to accept an appointment that has been offered to him of director of a sanitary establishment in Germany. It is to be hoped that his new position will enable him to continue at least his exceedingly interesting and valuable historic studies.

History.

Ethnologic Medicine.

The principles of the general development of the arts applied to Medicine (according to Science) is the subject of an article by Dr. J. H. McCormick in the American Antiquarian for August last. He points out that in many tribes, geographically remote, at the same stage of culture, similar ideas and methods in reference to the practice of medicine and the power of drugs prevailed. Magical formulas were adopted for the cure of disease, and mysterious and eccentric remedies were in vogue, all quite analogous in like stages of culture everywhere. The conjurations of the ancient Egyptians, *mutatis mutandis*, would pass for those of the Cherokees or Nahuas.

The author draws the just inference that those who assert that such similarities are evidences of historic unity, and that they should be explained by some ancient community of culture, do not apprehend modern psychology. This teaches, as its basic principle, that like conditions lead to similar trains of thought and those to analogous results.

Pharmacy among the Aztecs.

Dr. D. Luis Comenge finds evidence that the Aztecs had made considerable advances in medicine. Asylums for the invalid soldiers and hospitals for the sick and aged were maintained where the action of remedies could be studied in greater or less detail. They also suported botanical and zoological gardens. Sustained by evidence from Humboldt and other travelers, Comenge brings forward some interesting details. *Cassia fistula*, tamarinds, "neutle" (pulque) and "hoaxin" (a kind of tamarind from the leaves and pods of which a beverage was prepared), were used as laxatives. The seeds of *Ricinus communis*, a Mexican *Aristolochia*, valerian, and "cuitlpath", the root of "amamaxtla". a kind of rhubard, and above all jalap root, known by the abbreviated name "Halantlacuitlapilli", were used as purgatives. As Anthelmintic in young children, *Artemisia Mexicana* was used. The Aztecs used narcotics probably only to benumb the nerves of human sacrifices; *Cannabis Indica* and *Datura Stramonium* were called into service for this purpose. For certain nervous attacks, cramps and convulsions, they prescribed the juice of *Artemisia*. As diuretics, pulque, tobacco and *Veratrum Sabadilla* as well as *Cupressus Montezuma* H., the tubers of "zozoyatil", *Myrtus Pimenta*, *Taxates erecta*, *Centauria Cyanus* *Atropa dentata* and *Magnolia glauca* were used. As a remedy for calculi, a species of *Aristolochia* was used. For catarrh, *Salvia hispanica* was given. For wounds, urine, the leaves of *Schinus molle* and tobacco were administered.

[Apotheker Zeitung, No. 3, 1897, p. 25; from Farmacia Española.]

Bibliography.

Charles Scribner's Sons make a special offer to teachers for vol. I of Britton & Brown's Am. illustrated flora. (See Vol. 14, p. 282.)

Wm. R. Warner & Co. have ready for the press a pocket medical dictionary of about three hundred pages and comprising 10,000 definitions.

Ferdinand Encke announces the completion of the third volume of Otto Dammer's Handbuch der chemischen Technologie, a work in five volumes in which the editor is assisted by a number of colleagues.

Lemcke & Buechner call attention to the completion of the second volume of G. Kaufmann's large work: Geschichte der deutschen Universitäten, which deals with the origin and evolution of the German universities to the close of the Middle-Ages.

Under the title A Year of the X-Rays Prof. D. W. Hering will tell in Appletons' Popular Science Monthly for March in what directions progress has been made upon Roentgen's famous discovery. Some of the advances are indicated in the illustrations accompanying the article.

Due attention was called to the celebration of the 70th anniversary of Cannizzaro's birth-day last year. A volume dealing with the atomic and molecular theories and other subjects with which his name is connected, has just been published by international subscription as a souvenir of the event.

The Lloyd Library has been enriched by several large orders of books from Europe. Among those recently received is a collection of several hundred European pharmacopœias. A bibliographic article by Prof. Lloyd on American pharmacopœias and dispensatories appeared in the Dec. number of the Am. Journ. Pharm.

According to the Nation, Gustav Freytag's collection of over seven thousand volumes on the history of civilization in Germany has been added to the public library of Frankfurt. Freytag divided his collection into twenty-four departments, one of which comprised popular medicine. No doubt the pharmaceutical historian would find much of interest in this collection.

MM. L. Errera and E. Laurent offer a set of 15 colored wall plates illustrating plant physiology. These plates are suited in size for ordinary lecture room purposes, the dimensions being 70 cm. by 85 cm. From the statement of the prospectus, the choice of subjects seems good. The quality of execution can hardly be judged from the reduced sample cuts given. A volume explanatory of the plates accompanies each set. Price of plates and explanatory text, 50 francs. Publisher, H. Lamartin, 20, rue du Marché-au-Bois, Brussels, Belgium.

The Dutch Colonial Museum issues from time to time extra bulletins describing and illustrating oriental plants of economic and scientific interest. The large plates form a valuable accessory to the quite complete text. An account of the genus characteristics is followed by a full description of the species with frequent citations of older authors. A brief account of the chemical information concerning the plant and its products as well as the uses to which they are put completes the monographic treatment. Abundant and extended footnotes frequently contain much of value, critical notes, historical observations and other features of interest to the student find place. These bulletins are printed in the Dutch language.

To all interested in the European flora and in particular that of Germany, the Deutsche Botanische Monatsschrift, published by Gebrüder Bornträger, Berlin, offers much of value. This periodical, enlarged to about 30 pages per month, contains articles, frequently illustrated, from the pens of Germany's foremost systematists. Since the prime object of this magazine is to contribute to the knowledge of the flora of Germany, certain genera of especial difficulty in that range receive particular attention. Among such genera may be mentioned *Salix*, *Rosa*, *Rubus* and *Hieracium*. While edited especially in the interests of systematics, articles in morphology and other branches of botany occasionally find place. In addition to original contributions, reviews of recent literature, news from botanical societies and personals receive attention.

Price-lists received:—

Lemcke & Buechner, New York. Monthly Bulletin of World-Literature, Nos. 11 and 12, 1896.

Oswald Weigel, Leipzig. Botanischer Lagerkatolog No. 83.

Commercial.

Queensland Arrowroot.

The following figures indicate the extent of the cultivation of arrowroot-producing plants in the indicated province of Australia.

Year.	Acres planted.	Arrowroot yield.
1892	222	576,738 lbs.
1893	192	448,737 "
1894	282	534,687 "
1895	192	346,853 "

Two plants are cultivated, the purple arrowroot, *Canna edulis*, and the white arrowroot, *Maranta arundinacea*. The former is chiefly grown, since the bulbs or roots spread near the surface of the ground and are easily harvested, while the white strikes deeply into the ground and is dug only with considerable labor. Since the product from the purple arrowroot is regarded as an adulteration if sold as arrowroot, very little goes to the United Kingdom, the greater part being exported to other parts of Australasia.

[Chemist & Druggist, 50, p. 129.]

Price-lists received:—

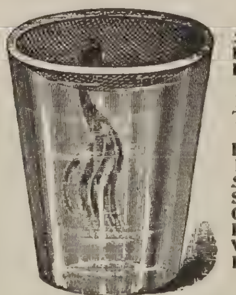
C. F. Boehringer & Soehne, New York. Price List. 1897.

G. & R. Fritz, Vienna. Preis-Liste, Januar 1897.

The Roessler & Hasslacher Chem. Co., New York. February 1897.

Mueller & Co.—Fehrenbach & N. Y. Scientific and Chemical Glass-ware.

Dr. Peters & Rost—Berlin. Neue Laboratoriums Apparate. Dec. 1896.



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Do not attempt to **test** the **solubility** or **insolubility** of a pill by hammering it on a pine board. What does it signify? **Simply take a glass of water 98° to 100° and suspend the pill as indicated below:**

The TRUE TEST of the solubility of a pill.

This test is demonstrative and conclusive proof of the solubility of mass pills, bearing the name of **Wm. R. Warner & Co.** because what **dissolves in plain water must dissolve in the warm visceral fluids of the body.**

FRIABILITY is no proof of **SOLUBILITY** as is evidenced by the following experiment:

Our chemist took Pil. Cathartic Comp. of Wm. R. Warner & Co.'s make (and the same of Friable Pills) and placed them in water 98° to 100°.

These are the results:—

PIL. CATHARTIC COMP.

WM. R. WARNER & CO. (Mass Pills)
Sugar-coated — dissolved in 20 minutes.
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Friable Pills.
Dissolved in 65 minutes.

Every five minutes the pills were rolled with the finger, each getting **same amount** of rolling, or about equivalent to peristaltic action. We have proven the solubility of our mass pills. We have proven that **Mass Pills are more soluble than Friable Pills.** Try it yourself and you will reiterate our statement that

FRIABILITY is not a proof of **SOLUBILITY.**

Our pill business has been established for the past forty years, and we have never had complaints as to the inactivity of our pills. By taking a dose of Cathartic Pills and noting results is all that is necessary to prove their efficacy.

WM. R. WARNER & COMPANY,

MANUFACTURING PHARMACISTS, PHILADELPHIA.

SUPPLEMENT, APRIL 1897.

Educational and Scientific Institutions.

Bacteriology at the N. Y. College of Pharmacy.

President Kemp of the N. Y. College of Pharmacy, impressed with the needs of bacteriological instruction, has donated $500.00 for the equipment of a bacteriological laboratory. Dr. Jelliffe is to be in charge of the work.

A Botanical Museum.

Prof. Dr. Hausknecht has erected a botanical museum in Weimar at his own expense, which is placed under the direction of the Botanical Society of Thuringia. It is to serve as a central station or institute for investigation of systematic botany.

Biltmore Forest and Herbarium.

At Biltmore, North Carolina, Mr. Geo. W. Vanderbilt owns an extensive tract of land known as the Biltmore Forest. The owner has undertaken to place these lands under systematic forest management as a permanent source of income. With this end in view skilled foresters and woodsmen are employed to superintend the regeneration and care of the forest and the harvesting of the timber. On a portion of the estate an arboretum will be maintained, while a library of forest botanical works and an herbarium will furnish opportunities for the study of forestry questions.

The directors of the herbarium announce in a neat pamphlet, recently issued, a list of several hundred North Carolina plants for exchange. Among these are some that can rarely be obtained in exchange. Persons desiring plants from this region should correspond with the curator Mr. C. D. Beadle, who will gladly furnish information to all wishing to exchange.

University of Berlin.

The university at the German capitol is to have a new chemical institute which is to cost 943,900 marks. The equipment is estimated at 250,000 M. more. This will give the best laboratory facilities for the study of chemistry to the University of Berlin, a prerogative which it lost a number of years ago. The old institute built according to the plans of A. W. v. Hofmann in 1865/9 had a lecture capacity for 300 and working desks for 70. At that time it was again as large as any chemical institute in Germany. The study of chemistry at other universities, however, was stimulated by the erection of large and elegantly equipped laboratories, so that Berlin had to take a back seat in this respect. This was true even in spite of the erection of a second chemical institute at Berlin with a working capacity of 38 and an addition of 12 desks to the old laboratory. The new institute is to contain a lecture room with a capacity for 400, laboratory places for 250 students and desks for 25 independent investigators. The present budget allows M. 200,000 with which to begin the work.

British Universities and the Natural Sciences.

From a recent number of the Pharmaceutical Journal we take the following "annotation": — "British universities, it is contended, do not turn out the right sort of men, and our manufacturers do not demand the right sort of information. The universities cram men with book knowledge, and test it by everlasting examinations. As a result they turn out pedagogues very competent to cram and examine in their turn, but possessing neither ability nor inclination to deal with the application of science to affairs. In Germany, on the other hand, science training deals with things, not only with books, it places its men according to the ability they display in conducting actual investigations and solving practical problems for themselves. When those men leave college they gladly enter the laboratories of manufacturers, where they are entirely at home and immediately useful, and manufacturers are equally glad to have them, and to pay them for research conjoined with practical direction of existing processes. It is not to be wondered at, therefore, that British manufacturers who try book-made men of science, find them upon the whole of less use than intelligent foremen, and we are forced to the conclusion, that, if Germany be really pushing us out of markets in which success depends upon the continuous application of science to affairs, the reason is, as recently stated in this Journal, 'lack of enterprise, disinclination to depart from old-fashioned habits, unsatisfactory business methods, and support of fads.'"

Dissolution of a Bogus Medical College.

The checkered career of the Wisconsin Eclectic Medical College of Milwaukee has come to a close as far as Wisconsin is concerned. A meeting of the directors of the college was held in Milwaukee on the 4th of last month, at which time a resolution of dissolution was adopted. A notice of dissolution was filed in the office of the secretary of state on the 8th.

Attention was called in this journal to the vicious proceedings of this bogus institution last summer (vol. 14, p. 145). Articles of corporation had been filed Dec. 31, 1895. Under the laws of the state incorporation could not be refused by the secretary of state. The attention of the state attorney, however, was soon directed to the manner in which this college sold diplomas without having a faculty or any other facilities whatever for teaching. Druggists, nurses and others with a smattering of medical knowledge were flooded with circulars denouncing regular medical education and offering degrees at almost any price.

Having learned these facts by a personal visit to the college and after consultation with "Dr." Fred. Rutland, its president, the state attorney secured an order from the supreme court allowing him to institute proceedings to revoke the charter of the college. Actual proceedings, which were delayed, became unnecessary, a notice of dissolution having been filed.

Shortly after proceedings were instituted the "college" moved its headquarters to 1001 West Congress St., Chicago. A month or more ago "Dr." Rutland was arrested in Chicago by the postal authorities for fraudulently using the U.S. mails. This was brought about by the secretary of state for Wisconsin, who wrote to the postmaster at Chicago under date of Oct. 7, calling his attention to the methods of the college and the action taken in Wisconsin.

A member of the present Wisconsin legislature, who makes no claim whatever to the possession of medical knowledge or skill, holds a diploma from this college. He seems to make good use of this diploma to secure the passage of a medical bill now pending before the legislature. The people of Wisconsin have been so thorougly roused by the shameful proceedings of this fraudulent institution that the passage of a state medical bill does not seem alltogether improbable at present.

Miscellany.

Dr. de Vrij, the nestor of Dutch apothecaries, celebrated his 84th birthday on January 31 of this year, yet, according to his own words, he is one of those who are among the first to welcome any necessary and useful change.

A Centenary.

An electrical exhibition will be held in 1899 at Como to celebrate the centenary of the invention of the Voltaic pile—Volta being a son whom Como delights to honor. It happens that Turin is going to have a similar show in 1898, but Come counts upon the prestige of Volta's name, as well as upon such relics of him as it may be possible to gather together, to counterbalance the prejudice resulting from this fact. The exhibition will not be confined to electricity alone, but will include fabrics of silk, Como's greatest actual industry.

Attfield Testimonial.

The retirement of Prof. Attfield from the school of the Pharmaceutical Society after thirty-four years as teacher, and the causes for such retirement were duly announced last year. That the personal friends and former students desired to honor their friend and teacher also soon became known. It seems, however, that numerous persons, who simply knew of Dr. Attfield through his Manual of Chemistry or other publications also became desirous of adding their tribute to that of his personal friends and pupils. The Secretary and Treasurer of the General Committee (Mr. John Moss, 39, Tressillian Road, St. John's, London, S. E.) has sent out a circular informing such persons who desire to honor Prof. Attfield, that their tribute will be welcome.

The testimonial is to take principally the form of an illuminated album containing the names, "(a.) of his pupils at Bloomsbury during his professorship of 34 years there, (b.) of those students of his writings and his Manual who feel that the honour and advantage of their calling have been promoted by his labours, and (c.) of his pharmaceutical, medical, chemical and other public friends generally in Great Britain and Ireland, India, the Colonies and the United States."

Professor Hubert Herkomer, the great Academician and friend of Prof. Attfield has offered to "do a plate" of the Professor according to his new method. This plate he has practically placed at the disposal of the committee. Whereas those who send their autographs are expected to contribute sufficient to defray the expenses of the album (not to exceed five shillings), those who desire a copy of this portrait signed by the artist are expected to send neither more nor less than ten shillings. Inasmuch as it will be impossible for the committee to obtain the addresses of all who may desire to contribute, those sufficiently interested can address the Secretary, whose address is given above.

A Year of the X Rays.

Many experiments were made to determine the source from which the rays proceed before it was learned definitely that they emanate from the surface upon which the cathode rays first impinge — a fact that was announced almost simultaneously by several experimenters. It is one of the important points that have been determined, and even this was distinctly intimated by Prof. Röntgen in the twelfth section of his original paper.

In intensity they vary inversely as the square of the distance from their source.

They electrify some bodies positively and some negatively, and whatever charge a body may already have they reduce or change it to the charge which they would independently give to the body. Their penetrating power depends upon the length of time they act.

Thus, gradually, these and many additional isolated facts have been established, and no doubt enough data will be accumulated eventually to permit generalization into laws; but that stage has not yet been reached.

Four theories have been suggested:

1. "They are ether waves, like ordinary light, but of exceedingly brief period, therefore ultra ultra-violet."
2. "They are streams of material particles."
3. "They are vortices of the intermolecular ether, forced from the cathode when the gas pressure is sufficiently low. Rectilinear propagation, absence of reflection, etc., follow from the properties of vortices."
4. "They are variations of stress in the dielectric surrounding the vacuum tubes."

Each of these theories is entitled to the Scotch verdict "Not proven," though the preponderance of opinion is on the side of the first. Still, it can not yet be said to be more than opinion.

[Pop. Sc. Monthly, March.]

In Memoriam.

Prof. Bourgoin, Professor of Pharmacy at the Paris School of Pharmacy and Director of the Pharmacie centrale des hôpitaux de Paris is reported as having died suddenly.

Dr. Paul Taubert, formerly of the Royal Botanical Museum of Berlin, who left for Brazil a year ago with his wife in order to botanically explore the Amazon territory, died of yellow fever.

Prof. Constantin v. Ettinghausen died Jan. 31 in Graz, Austria, at the age of 71. He was professor of botany at the University and as such was teacher also of pharmaceutical students. He is, however, better known in general botany and paleontology.

Bibliography.

The new supplement to the Belgian Pharmacopœia which was to have appeared in January, will, it is announced, not be out until May 1.

The chemical library of Prof. A. v. Kekulé consisting of 19,000 volumes, has been purchased by the Farbenfabriken, formerly Friedrich Bayer & Co., of Elberfeld.

John Wiley & Sons have issued a revised and enlarged third edition of Laboratory Calculations and specific gravity tables by John S. Adriance. All the calculations are based on the atomic weights as recalculated in 1882 by Prof. F. W. Clarke.

Julius Springer annouces as just out a Handbuch der Arzneimittellehre by Dr. S. Rabow and Dr. L. Bourget, both professors at the University at Lausanne. It is intended for the use of students and practicing physicians. The book appears simultaneously in both the French and German languages.

Felix Alcan announces the completion of the sixth enlarged edition of the Dictionnaire de Médecine et de Thérapeutique by Professors E. Bouchut and A. Després, both of the medical faculty of Paris. It is a double column quarto volume of 1630 pages with 1001 engravings in the the text and three charts.

The Table of specific gravities of U. S. P. preparations compiled by F. Dietze, an apothecary of Berlin, Ger., which appeared in the February number of this journal, has been struck off as separates on card-board for laboratory use. Copies can be had from the Pharm. Review Publ. Co.

Wahl and Henius announce as in the press their Handy-book of the brewing, malting and auxiliary trades. Its primary object is to supply a reference book that shall give to the practitioner or the student full information in concise, but clear, form on such questions as may call for explanations from day to day.

The Pharmaceutische Wochenschrift, a pharmaceutical weekly, published in Berlin, has with the beginning of the fourteenth volume reduced the size of its page one-half, whereas the Pharmaceutische Zeitschrift für Russland another pharmaceutical weekly, published in the German language in St. Petersburg, has almost doubled the size of its page with the first number of the thirty-sixth volume.

Dr. Josef Bersch, editor of the recently completed Waarenlexikon, published by A. Hartleben's Verlag of Vienna, is now engaged in editing a Chemisch-technisches Lexikon, which is to contain 17,000 recipes pertaining to all industries and the arts. The work is published by the same Vienna firm and the editor is assisted by numerous colaborers of the Chemisch-technische Bibliothek.

The New England Druggist has been purchased by the "retail pharmacists of New England," who, "recognizing the desirability and advantages of a corporation that should own and publish a pharmaceutical journal entirely devoted to the interests of progressive pharmacy," have herewith entered the field of pharmaceutical journalism. Prof. Wilbur L. Scoville remains editor of the journal.

Catalogues received:

Lemcke & Buechner — New York. Monthly Bulletin of World-Literature, Jan. 1897.

F. Bauermeister — Glasgow. Classified catalogue of the leading English, German, French, Italian and some American Medical Periodicals.

Open Court Publ. Co. — Chicago. Important biological publications and works on kindred topics.

Gustav Fock — Leipzig. Lagerverzeichniss No. 126: Medicin.

Commercial.

The Merck Pharmacy.

Circulars have been issued informing the pharmaceutical public that the Merck Pharmacy, about which there has been a great stirr in certain quarters, has been opened. It is not only to be a model pharmacy in the best sense of the word, but it is to be, in a certain sense, a central pharmacy. Inasmuch as a circular, giving a full account of the character and object of the pharmacy, has been issued by the director, Mr. Alpers, all that is necessary at this time is to record an event that will no doubt be considered a milestone in the history of American pharmacy.

The Trade in Crude Rubber and the Sources of Gutta-percha.

The Popular Science Monthly for March contains an unusual number of articles of special interest to pharmacists. The trade in crude rubber and the sources of gutta-percha are discussed by Clarke-Dooley.

This remarkable substance is obtained from the milky juice of certain trees and different varieties of climbers. South America is the principal source of supply—Brazil, of the many states producing it, leading in quantity and quality, and having in its great forests sufficient to meet twice the wants of the world. The best in Pará (fine, medium, and *sernamby*), from the great basin of the Amazon, where more than eighty thousand *seringueiros* (gatherers) are engaged in the dry season in collecting gum. White Pará, "virgin sheets," a new variety in three grades, comes from Matto Grosso. Since its importance first began to be felt, this gum has exerted an increasing influence upon the spread of civilization, especially along the Amazon and Orinoco and their tributaries and the great streams which pour out from the interior of the Dark Continent. Pará, formerly an insignificant village, has grown to be a city of a hundred thousand inhabitants, with modern features, and Manáos, up the river, is fast following it. India rubber is the mainstay of the northern Brazilian states, Bolivia, and eastern Peru. Brazil has a great advantage in its immense waterway; ocean-going steamers run twelve hundred miles up the Amazon, whereas every African river except the Congo has a bar at its mouth and cataracts not far distant from the coast line. It is, besides ivory, about the only commodity produced in the interior of a tropical country that will bear the expense of transportation, often on the heads of natives along tangled man-paths, to the seaboard. So in many places it has been the basis of first commerce.

Gutta-percha, like India rubber, is obtained from the juices of certain trees and climbers. The best is produced by a tree, the *Isonandra gutta*, of the order *Sapotaceæ*, which formerly abounded at Singapore and in all Malaysia, but which now tends to disappear under the ravages committed by gatherers. *Gutta*, in Malay, signifies gum or lime; *percha* signifies scrap. Incisions are made in the bark, as on rubber trees, and the liquor flows of perfect whiteness, darkening at contact of air. Coagulation takes place spontaneously in a short time. Like rubber, the liquid forms a film on top. This cream is removed, kneaded into a large lump and plunged into boiling water. Under the action of a high temperature it softens and forms the cake usually found in commerce. Other trees in Malaysia and Farther India, in Cambodia and Cochin China, produce good gutta. In Hindustan different grades are mixed by the natives. Chinese merchants, in their depots, mix and manipulate to give a good appearance to the product, as the price is constantly advancing. As the gatherers also do not scruple to add vegetable *débris*, earth, or sand, it has become difficult to secure a pure article. An inferior quality is obtained from trees and climbers in Africa and Madagascar, and, with the development of those countries, more may be expected.

Reports and Catalogues received:—

Caeser & Loretz—Halle a. S. Geschäfts-Bericht, Sept. 1895, pp. 44, and Sept. 1896, pp. 51.

Heinrich Haensel — Pirna a. d. Elbe. Bericht über das vierte Vierteljahr 1896, pp. 32.

—— Extract from quarterly report on essential oils and fruit essence. Jan. 1897.

Max Kaehler & Martini—Berlin. II Nachträge, 1897.

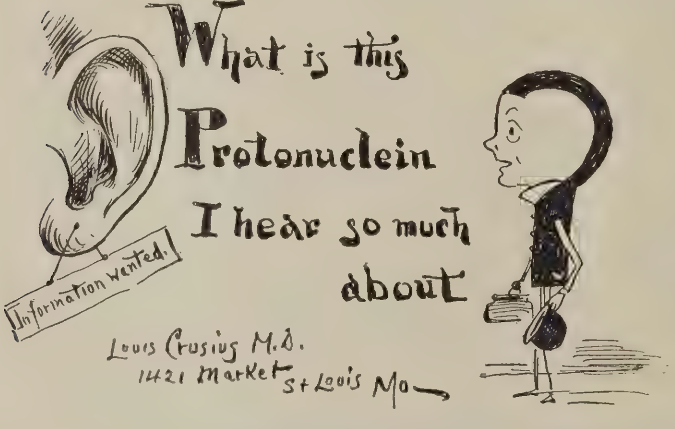
Lachesis rhombeata and its Venom.

In homeopathic materia medica are two preparations called *Lachesis* which contain the venom of *Lachesis rhombeata* or *muta* L. (in homeopathic literature *Trigonocephalus Lachesis*) with powdered milk sugar or merely diluted.

This highly dangerous reptile lives in pairs in the primeval Brazilian forests and is closely related to the rattle-snake. The tail ends in the male in a long (4 to 10 cm.), horny, black point, which in the female remains rudimentary. Dr. Th. Peckolt of Rio de Janeiro has studied the venom of this serpent. The amount present is proportional to the length of the animal. A male specimen 3 meters long, 21 cm. in circumference yielded 1.680 grams of poison. The poison fangs were 6 cm. long. The male and female are nearly alike in markings, the back being dirty reddish, the belly shining yellowish-white.

The fat of this reptile is white, thickly fluid, with a repulsive odor. Sp. grav. at 25° C. 0.906. The animal gives out a musk-like odor which betrays its presence. The venom is acid in reaction, odorless, with a sp. grav. of 0.9845 at 23° C. After preservation for a year, the venom still remained unchanged.

[Oesterr. Zeitschr. f. Pharm., Nos. 2 & 3, 1897.]



(Reproduction from Postal Card.)

Among the many inquiries we receive, the one here reproduced is so unique that we have, with thanks to the artist, made use of it in place of our regular advertisement for this month.

PROTONUCLEIN

stimulates the nutritive functions, increases resistance to disease, promotes glandular secretion and restores tone to the system; cell life throughout the organism is stimulated and health augmented.

Samples and literature upon request.

REED & CARNRICK,
NEW YORK.

SUPPLEMENT, MAY 1897.

Educational and Scientific Institutions.

University of St. Petersburg.

Mr. Ssimin has donated 100,000 roubles to the University of St. Petersburg for a bacteriological observatory.

Consolidation of Medical Colleges.

The Medical College of the New York University and the Bellevue Hospital Medical College, according to Science, have been consolidated under the control of New York University. The enrollment of students last year in the two schools was 1057.

University of Berlin.

According to Science, a bill before the German House of Representatives appropriates about two and a half million dollars for rebuilding the hospitals and clinics of the University of Berlin, and about two million dollars for the establishment of the Botanical Gardens with its museum and the pharmaceutical laboratory at Dahlem.

National Department of Health.

In view of the present advocacy of a department of health under our government, it may be worth noting that the Lancet commends a similar plan for Great Britain, proposing that there be a minister of health with a seat in the Cabinet. If such a department is established at Washington, Pharmacy should not remain without representation.

National Department of Science.

The forcible arguments urged by Lord Lister and other members of the recent deputation to the British Prime Minister on the question of a National Physical Laboratory apply equally to a similar institution at Washington. Attention is called to the able advocacy of this plan by Professor F. W. Clark in Science (Jan. 22d). A department that will do for the manufacturers and commerce of the nation what the Department of Agriculture now does for the agricultural interests might properly begin with an intitution at Washinston similar to the German Reichsanstalt and the National Physical Laboratory now urged by English men of science.

Scientific Societies.

American Medical Association.

The American Medical Association will meet in Philadelphia, beginning on June 1st. The American Publishers' Association meets on the preceeding day. There are said to be published in America 275 medical journals, of which 10 are issued weekly, 11 semi-monthly, 225 monthly, 6 bi-monthly, and 23 quarterly.

Germany's Apothekerrat.

Director Dr. von Bartsch has issued circulars to the members of the Apothekerrat inviting them to attend a session on the 31st of this mouth and the following days. The German apothecaries have been clamoring for years for representation in the government councils of their affairs. It is of interest to note that the subject suggested for discussion by the minister at the first session pertains to women pharmacists: To what extent and under which conditions can women be employed in pharmacy. Two reports have been prepared and submitted to the members of the council.

Paris Apothecaries Society.

This society celebrated a hundreth anniversary on March 18 and expects to celebrate another in 1903. The first celebration was in honor of the revival of regular pharmaceutical instruction at the School of Pharmacy under the directorship of Trousson. For several years previous the members of the school were more interested in the preparation of saltpetre, beetsugar and other useful articles than in teaching. The second centennial will be in honor of the reorganization of the society in its present form.

XII. International Medical Congress.

The Twelfth International Medical Congress will convene, as announced last year, in Moscow from the seventh to the fourteenth of August. The congress will be comprised of physicians, but other scientists, including pharmacists, are admitted as extraordinary members. The extraordinary members will receive all of the publications, but their activity will be restricted to the sections in which they are inscribed and they will not be permitted to vote on questions concerning the organization of the congress. Of the fifteen sections the following are of interest not only to physicians, but to others as well: —

II. Physiology, comprising medical chemistry.

IV. *a*. General Therapy, including hydrotherapy and climatotherapy.

IV *b*. Pharmacology.

IV *c*. Pharmacognosy and Pharmacy.

XV. Legal Medicine.

French is the officially recognized language of the Congress, but communications can be written and debates in the sections can be conducted in either French, German, English or Russian.

Calendar of State Pharmaceutical Associations.

Name.	Date.	Place.	Secretary.
Alabama	May 11, 12	Selma	P. C. Candidus, Mobile.
Arkansas	May 12-14	Little Rock	J. B. Bond, Jr., Little Rock.
California	May 11, 12	San Francisco	G. J. Harvey, San Francisco.
Delaware	May 6	Milford	F. W. Fenn, Wilmington.
Florida	May 12 ? (or 18)	Pensacola	H. C. Cushman, Pensacola.
Georgia	May 18, 19	Macon	C. T. King, Macon.
Indian Territory	May 18-20	South McAlester	E. P. White, Claremore.
Kansas	May —	Junction City	Mrs. M. O. Miner, Hiawatha.
Louisiana	May 11-13	New Orleans	J. A. Legendre, New Orleans
Maryland	May 12	Baltimore	J. H. Hancock, Baltimore.
New Jersey	May 5, 6	Princeton	G. T. Fitzgeorge, Trenton.
North Carolina	May 12	Raleigh	H. R. Howe, Fayetteville.
South Carolina	May 20	Charleston	J. A. Barbot, Charleston.
Texas	May 18-20	Galveston	R. H. Walker, Gonzales.

History.

Some Historic Facts about Glycerin.

The following is a translation from an article by G. Arends in the Ber. d. pharm. Gesellsch. on The history and technology of glycerin.

Seldom has a product, which for centuries had been regarded as useless waste, gained in so short a time an equally important place in the chemical industry and in technics as has glycerin. Only 50 years ago it was merely an object of scientific interest and that only very limited, yet since the discovery of nitroglycerin by Nobel in 1862 and of dynamite in 1867 it has become the fundamental requisite for the most important technical works which man has yet undertaken, and it may claim a large share of the success achieved in recent years in all the branches of commerce, industry, mining and national defense. One need only think of the great benefit of our great tunnels and artificial channels, the power of mines and torpedoes and the countless other uses of dynamite in the arts. Glycerin itself has grown no less important, since in consequence of the extended production of stearin-candles large quantities of it were produced, which had to be utilized. This whole product is now used in the manufacture of explosives, of soap and perfumes, in printing, in the manufacture of woven fabrics, in the gas industry, in pharmacy and a few other industries.

As is well known, glycerin was discovered in 1779 by Scheele, when after washing lead plaster he subjected the water to a closer examination. Later he also isolated it from almond oil, lard, butter, etc., and called it *Ölsüss*, while others advocated the names *Fettzucker* or *Ölzucker* (whence the old name *Principium dulce oleorum*). Chevreul was the first to introduce the name glycerin, after having studied the substance more closely and learned its alcoholic nature, giving it the constitutional formula C_3H_2O+HO. Pelouse in 1826 expressed the hydrous glycerin by $C_6H_7O_5+HO$ and the anhydrous preparation by $C_6H_5O_7$, whereas Stenhouse in 1841, concluded from the analysis of palmitin, that glycerin ought to be represented by the formula C_3H_2O, and Berzelius soon after (1844) believed in the presence of a special radical in the fatty oils and the fats which he called Lipyl and designated it by the formula C_3H_2. He represented glycerin as the oxide of this radical, whence the name, formerly used, Lypiloxide C_3H_2O. Later it was thought to be the hydrate of a substance, of glyceryloxide, $C_6H_7O_5$, and consequently it was called glyceryloxydehydrate $C_6H_8O_6$, but Mohr in his commentary on the *Pharm. Borussica VII* says that this conclusion is wrong: "If it were a basic oxide, how could it liberate itself from the fatty acid (by water vapor) with which it is in constant intact." Yet the assumption, that glycerin is basic hydrate, was not wrong, for at the present time we consider it a basic substance, a triatomic alcohol with the formula $C_3H_5(OH)_3$, ever since Berthelot has established its triatomic nature.

Personals.

Mr. C. G. Lloyd is again on a botanizing trip in the South. At present he is in Louisiana where rains and floods are enabling him to reap a rich harvest of fungi.

Mr. E. P. Sheldon, lately instructor in botany at the University of Minnesota, has accepted a commission from the National Herbarium to organize a field party for the exploration of the Blue Mountains in Oregon. He expects to devote at least six months to the field work.

From the plans submitted in the competition for a statue of von Helmholtz, those by the sculptors Lessing, Hertert and Janensch have been selected and exhibited in Berlin. The final selection has not been announced. The statue will be placed in the court of the University near the statues of the two Humboldts.

In Memoriam.

Josef Fuchs.

The Austrian Apothecaries Society has suffered a great loss in the death of Mr. Josef Fuchs. He was not only a member of the society for 33 years, but was of great service as custodian of the society's collections, and an officer for fourteen years at the pharmaceutical school. He did not only serve without remuneration but donated while living 40,000 fl. to the society. Such members and officers are rare indeed.

Edson Sewell Bastin.

Edson Sewell Bastin, Professor of Materia Medica and Botany at the Philadelphia College of Pharmacy, died on Tuesday morning, April 6, 1897, at the Medico-Chirurgical Hospital of Philadelphia, the immediate cause of death being cerebral hemorrhage. While he had been suffering from nervous prostration since last October, and had been unable to attend to his work, his sudden demise came as a shock to his many friends. The funeral was held at his late residence in Merchantville, N. J., on Friday, April 9, 1897, and was largely attended by members and students of the Philadelphia College of Pharmacy, members of the Alumni Association an friends of the deceased.

Professor Bastin was born near Milwaukee in 1843. His early life was spent in attendance upon the district school and in work upon his father's farm. When fifteen years of age he went to Carroll College, in Waukesha, Wis., but while he was studying there the Civil War broke out, and, going to the front at once, he served three years in the United States Volunteer Corps.

In October, 1865, Professor Bastin entered the University of Chicago as a student, and graduated in 1867. Shortly afterwards he entered the drug business, but in 1874 he sold out and commenced teaching in the Chicago University, where he remained for some years, the larger part of the time occupying the chair of Geology and Botany. In 1876 he accepted the position of Lecturer on Botany at the Chicago College of Pharmacy. Resigning from this institution in 1889 he began lecturing in the Northwestern University College of Pharmacy, where he remained until 1893.

He was appointed to the position he held in the Philadelphia College of Pharmacy on October 4, 1893, to succeed the late Prof. John M. Maisch, in which position he did much to materially improve the instruction of both botany and materia medica.

Bibliography.

A new edition of the Russian Pharmacopœia is in course of preparation.

The fourth edition of Dr. Alexander Classen's Quantitave Analyse durch Elektrolyse has just been published by Julius Springer of Berlin.

Vandenhoek & Ruprecht of Goettingen have published Beiträge zur Kenntniss aliphatischer Terpenabkömmlinge, by W. Naschold.

Ueber Schilddrüsentherapie und Iodothyrin (formerly thyroiodine) by E. Roos has been published by J. C. B. Mohr, Freiburg i. B.

The first edition of the New York State Botanists' Report on Poisonous and Edible Fungi has proved insufficient to supply the demand, so that it will be impossible to fill further orders for this work unless a new edition is printed.

No. 1658 of the Nation contains an interesting review of two new books on Dalton and the atomic theory, the one by Sir Henry E. Roscoe and the other by Roscoe and A. Harden. Both books are published by G. Macmillan.

Zeitschrift für comprimirte und flüssige Gase is the title of a new journal published in Berlin and edited by Dr. M. Altschul (Berlin C., Adlerstr. 14). The cooperation of about forty eminent colaborers has been secured.

Volume one of Sammlung chemischer und chemisch-technischer Vorträge by Prof. Felix B. Ahrens has been completed a short time ago. It contains nine essays by eight specialists. The publisher, Ferdinand Enke of Stuttgart, now announces as completed part one of volume two: Die Benzoltheorie by Dr. Willy Markwald.

The history of the Bubonic Plague is told and its nature described in Appletons' Popular Science Monthly for May by Prof. Victor C. Vaughan, of the University of Michigan, who also considers the conditions that contribute to its spread, and presents the results of the latest studies of the bacillus by which it is supposed to be engendered.

The French Minister of Instruction has called a commission to edit a new edition of the French pharmacopœia. President: the Director of higher education Liard; Vice-President: the Director of the Paris School of Pharmacy Brouardel. Among the members of this commission pharmacy will be represented by Bourquelot, Jungfleisch, Moissan, Prunier, Vigier and Yvon.

The Zeitschrift für Bücherfreunde is a new journal published by Velhagen & Klasing (Lemcke & Buechner, New York), which all book-lovers familiar with the German language will want to see at least if they cannot become regular subscribers. The first number which has just appeared is replete with interest and a first class production in every way.

Julius Springer announces the completion of the seventh edition of the Neues Pharmaceutisches Manual by Eugen Dieterich. The same publisher calls attention to Krankenpflege, a handbook for nurses and families, by Dr. Julius Lazarus. The book is designed to give instruction in popular language to persons in charge of patients in order that the directions of the physician may be properly carried out.

R. Friedlaender & Sohn of Berlin have been commissioned with the distribution of Ueber giftige Eiweisse, welche Blutkoerperchen verkleben, by M. Elfstrand. After a brief review of abrin and ricin the author discusses his own work with the croton poison. The book is devided into a chemical and a pharmacological part. The examinations were conducted in the laboratories of Prof. Kobert in Dorpat, Prof. F. Hohngren in Upsala, and Prof. Schmiedeberg in Strassburg.

The Therapeutische Monatshefte for March review the Beiträge zur Dermatologie und Syphilis, a Festschrift dedicated to Georg Lewin in honor of the fiftieth anniversary of his doctor's examination. On Nov. 5, 1895, this was handed to the senior dermatologist of Berlin as a "Festgabe" from colleagues, friends and students. It contains the portrait of Lewin and 21 essays. On this side of the Atlantic we seem to have little time for such expressions of appreciation. As announced, Lewin has since died.

Monographien aus der Geschichte der Chemie is the title of a series of historic pamphlets to be published "in zwanglosen Heften" by Johann Ambrosius Barth. The editor is Dr. Georg W. A. Kahlbaum, professor at the University of Basel. The first Heft is to treat of the following subjects: Die Einführung der Lavoisierschen Theorie im besonderen in Deutschland; and Ueber den Antheil Lavoisier's an der Feststellung der das Wasser zusammensetzenden Gase. August Hoffmann is coauthor with the editor.

Less than two years ago the Lloyd Library building had to be enlarged to accomodate the rapidly growing library. Only a year ago the accomodations appeared liberal for a private library of considerable size. However, the growth has of late been such that an architect is now at work making plans for liberal extensions both to the front and by the addition of another story. Pharmaceutical and botanical students of this country have every reason to rejoice over the growth of this institution.

The chemical Publishing Co., Easton, Pa., calls attention to two works on applied chemical analysis: 1. Wiley's Principles and Practice of Agricultural Chemical Analysis, the third volume of which on Agricultural Products has been recently completed; 2. Engineering Chemistry: a manual of quantitative chemical analysis for the use of students, chemists and engineers, by Dr. Thomas B. Stillman, Professor of Analytical Chemistry in the Stevens Institute of Technology.

As announced last year new editions of Beilstein's Handbuch der organischen Chemie will be published by the German Chemical Society. The third edition still edited by Prof. Beilstein is nearing its completion. The announcement is now made that supplementary volumes are to be published in the near future and that a new edition will not be begun until 1905. Persons using Beilstein's work are urgently requested to notify the Secretary of the German Chemical Society, Prof. P. Jacobson (Berlin, N W., Georgenstr. 35) of any inaccuracies or omissions that may have come to their notice. It is only through systematic cooperation that the best in this direction can be achieved.

Appleton's Popular Science Monthly for April contains the conclusion of Prof. Hodge's article on Experiments on the physiology of alcohol. One of the briefer yet interesting articles is that by Prof. M. Heim on Ants as the guests of plants, translated from the French. Spencer and Darwin by Grant Allen is republished from the Fortnight Review. Reversions in modern industrial life by Franklin Smith will be of interest to those pharmacists who are interested in some of the modern tendencies of their calling.

The Colorado Medical Library Association has, for some years, been accumulating, in connection with the public library of Denver, a valuable medical reference library. This library is supplemented by numerous private collections which, however, are at present not available to the medical public. The association is now to prepare a classified list of the works these private libraries contain, which will also indicate in whose office each book may be found, and at what hours readers may refer to it. This plan of cooperation certainly merits to be duplicated wherever possible, whether on a small or a large scale.

Catalogues received:

Lemcke and Buechner — New York. Monthly Bulletin of World-Literature. 1897. No. 2.

Gustav Fork—Leipzig. Catalogue of Inaugural Dissertations.

Catalogue of the U. S. Public Documents. No. 26.

Commercial.

As a logical sequence to the complete equipment of their pharmacological and bacteriological laboratory for the careful testing of their drugs and antitoxic serums Parke, Davis & Co. have obtained the services of Dr. H. O. Hare, Professor of Therapeutics and Materia Medica in the Jefferson Medical College, Philadelphia, as Consulting Therapeutist for their house.

Dr. C. T. McClintock and Dr. E. M. Hazleton, formerly of the University of Michigan, will continue to supervise the manufacture of bacteriological agents, to test pharmaceutical products, and to investigate the physiological action of new remedies. There researches are, hereafter, to be supplemented by the study of the clinical behavior of drugs and the indications of their use on the part of Dr. Hare.

Catalogues received:

Parke, Davis & Co. — Detroit. Complete Catalogue for 1897.

Fries Bros.—New York. Synthetical Perfumes.

Roessller & Hasslacher Chem. Co. — New York. No. 97. April 1897.

Allairee, Woodward & Co. — Peoria, Ill. April 1897.

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SAMPLES, LITERATURE AND DIET LEAFLETS UPON REQUEST.

REED & CARNRICK, NEW YORK.

SUPPLEMENT, JUNE 1897.

Scientific Institutions.

Verein d. Naturforscher und Aerzte.

The sixty-ninth meeting of German Men of Science and Physicians, Verein deutscher Naturforscher und Aerzte, will be held at Brunswick from the 20th to the 25th of September. There will be thirty-three sections as compared with the thirty at the Frankfurt meeting.

British Chemical Society.

At the meeting of the society Thursday evening, March 25, Professor Percy Frankland delivered the memorial lecture on Pasteur, extending over two hours. At the anniversary meeting, March 31, Professor James Dewar was elected president in place of the retiring president, Mr. A. Vernon Harcourt. Professor William Ramsay was elected vice-president. The total membership of the society is 2080, exclusive of 27 honorary foreign members. During the year 120 papers had been printed in the societies Journal and 56 in the Proceedings. From the financial statement made by the treasurer, Professor Thorpe, it is of interest that the Research-Account now has investments of 6,945 l., a donation of a thousand guineas from Mr. J. J. Austin having brought it up to that amount. Grants amounting to 308 l. were made during the year to various investigators.

Philadelphia College of Pharmacy.

It is reported that the vacancy caused by the death of Prof. Bastin is to be filled by Dr. Henry Kraemer and Dr. Clement B. Lowe. A division of the double chair is to be effected.

Henry Kraemer is a graduate of Girard College and of the Philadelphia College of Pharmacy. He acted for several years in the capacity of assistant in Philadelphia and New York. While in New York he studied botany at Columbia College. For several years he was Reporter on the Progress of Pharmacy for the Am. Pharm. Assoc. In 1895 he accepted the chair of Botany, Pharmacognosy and Materia Medica at the Northwestern School of Pharmacy with the privilege of spending a year abroad. This year was spent at Marburg with Prof. Arthur Meyer. Having taken his doctor's degree, he returned and during the past year he has been engaged in instruction at Chicago.

Clement B. Lowe, who is to teach Materia Medica and Physiology graduated from Buckwell in 1865. He then entered the Philadelphia Polytechnic College, but on account of ill health gave up his studies and purchased a drug-store in Philadelphia in 1867, which he conducted until about two years ago. In 1884 he graduated from the Philadelphia College of Pharmacy and was appointed assistant to Prof. Maisch in 1887, which position he also held under Prof. Bastin. Mr. Lowe is also a graduate of the Jefferson Medical College.

The Zoological Station at Naples.

On April 14 the Zoölogical Station at Naples celebrated the twenty-fifth anniversary of its foundation, and the Frankfurter Zeitung of March 24 and 25 anticipated this event by giving a bird's-eye view of the work done by that important aquarium and biological laboratory, which has served as a model to numerous similar institutions that have since sprung up in various parts of Europe and America as well as in Japan. It was at a time when the scientific experts were still hotly debating the numerous questions suggested by Darwin's theories, that it occurred to Dr. Anton Dohrn to found, somewhere on the Mediterranean, a laboratory where marine animals might be studied at home, as it were; his belief being that the sea furnished the most valuable specimens for biological research. He had considerable means of his own, and he added to them the profits of his public aquarium at Naples. These, however, did not suffice for carrying out his comprehensive plans, and he therefore appealed to the government and universities of various countries for assistance. Naples gave him a convenient location, while the Ministry of Agriculture at Rome contributed $8,000 and an annual subvention of $500. The German Government recognized the value of the Zoölogical Station in 1880 by voting to contribute $7,500 a year, which sum was in 1890 increased to $10,000. These funds are augmented by means of an ingenious arrangement with various states and universities by which, in return for $500 a year, any one can secure a "table" in the laboratory with all the privileges and conveniences it affords. Germany and her universities have 10 tables, Italy 9, Austria and Russia 2 each, Holland, Belgium, Hungary, Switzerland, Rumania, Bulgaria, 1 each, while others are held by the universities of Oxford, Cambridge, Columbia, the British Association, Smithsonian Institution, etc. The only state that ever gave up its table was Spain, which no longer felt able to pay for it.

The means for securing material for all these students are as ingenious as the financial arrangements. Two small steamboats are in the service of the Zoölogical Station, and $1,500 is yearly paid to the Naples fishermen at large, who have instructions to bring to the laboratory such contents of their nets as are not utilized in the markets. Not only do the managers in this way secure abundant specimens for use in the laboratory, but arrangements have been made for forwarding specimens to biologists in all parts of Europe, this being another source of income. The institution employs 11 officials and 30 assistants, and the number of students is about 40 in winter, 20 in summer.

Calendar of State Pharmaceutical Associations.

Name.	Date.	Place.	Secretary.
Colorado	June 22-24	Manitou	C. E. Ward, Denver.
Connecticut	June 15,16	Bridgeport	A. S. Clark, Waterbury.
Illinois	June 2 & 3	Champaign	F. Fleury, Springfield.
Indiana	June 1 & 2	Indianapolis	A. W. Timberlake, Indianapolis.
Iowa	June 9—11	Waterloo Chat'qua	A. H. Miles, Des Moines.
Kentucky	June 15	Crittenden Springs	J. W. Gayle, Frankfort.
Massachusetts	June 8—10	Plymouth	J. F. Guerin, Worcester.
Missouri	June 8—12	Meramec Highland	H. M. Whelpley, St. Louis.
Nebraska	June 7—9	Plattsmouth	W. S. Heilman, Tecumseh.
Ohio	June 9	Cleveland	S. C. Hopp, Cleveland.
Pennsylvania	June 22	Del. Water Gap	J. A. Miller, Harrisburg.

In Memoriam.

Dr. Edmund Russow, Professor of Botany and Director of the Botanical Gardens at the University of Dorpat, died April 11. His special department of research was anatomical botany. He was an honorary member of the British Pharmaceutical Society.

The May number of the Am. Journ. Pharm. contains a biographical sketch of Robert Shoemaker of Philadelphia, who died Dec. 17 of last year. He was born Feb. 2, 1817, in Shoemakertown, Montgomery Co., Pa., to which state his ancestors moved in 1683 at the invitation of William Penn. In 1831 Mr. Shoemaker became apprenticed to a druggist in Philadelphia, whose store he purchased in 1837, when but twenty years old. While preparing plasters, he at the request of Prof. Procter (1846) made glycerin which was sold at $4.00 per pound in 1848. The entire product sold in 1848 was 15 lbs. In 1849 Mr. Shoemaker made about 200 lbs., averaging about $2.70 per lb. The specimen given Prof. Procter was the first glycerin made in Philadelphia, if not in America.

Though not a graduate of the Philadelphia College, Mr. Shoemaker was an active member of that institution. He was not only successful in his chosen calling, but in other lines of business as well.

Professional Ethics.

Buchner versus Koch.

There seems to be a dramatic aspect to the exploitation of Koch's "new tuberculin." Dr. R. Romme calls attention to it in the Presse médicale for April 21st. In the Münchener medicinische Wochenschrift for March 23d Professor Hans Buchner, of the Munich Hygienic Institute, published an article entitled Die Bedeutung der activen löslichen Zellproducte für den Chemismus der Zelle, in which he mentioned the researches of his brother, Professor Eduard Buchner, of the University of Tübingen, who found that by triturating the cells of beer yeast with sand and expressing the mixture under a pressure of from four to five hundred atmospheres he obtained a yellow liquid, clear or slightly opalescent, devoid of cellular elements, and having the remarkable property of inducing the alcoholic fermentation. From this fact Hans Buchner concluded that the agent of the alcoholic fermentation was not the beer cell itself, but a substance contained in its plasma, a zymase. This was in support of his theory of alexins. He added that some of his pupils, by means of a similar mechanical process of trituration, had extracted from the *Bacillus pyocyaneus*, from cholera spirilla, and from tubercle bacilli a liquid which seemed to have immunizing properties, but that the investigations were not yet finished.

Three days after the date of the Munich journal in wich Buchner's article appeared, the telegraph announced Koch's discovery to the world, and in a few days more, on April 1st, Koch's article on his "new tuberculin" appeared in the Deutsche medicinische Wochenschrift, but the article was dated November 14, 1896. Thereupon, in an editorial note in its issue for April 6th, the Münchener medicinische Wochenschrift called attention to the identity of Buchner's and Koch's processes and to the almost simultaneous publication of their articles. It asked if the appearance of Koch's article, a week later than that of Buchner's, had not been managed for the purpose of making it impossible for Buchner to set up a claim of priority, especially as Koch's article was dated back in November.

In a communication entitled Zu Robert Koch's Mittheilung über neue Tuberculinpräparate, published in the Berliner klinische Wochenschrift for April 12th, Buchner hints a plagiarism on the part of Koch, and says that in 1893 his brother Eduard proposed to the house of Meister, Lucius & Bruning to take out a patent for his trituration process of extracting the active principle from yeast. He says, further, that the application for the patent was denied, but not until the description of the process had remained open in the patent office for several months; that the description was finally published by Eduard Buchner, in January, 1897, in the Reports of the German Chemical Society, and that in that article Eduard said that Hans was at the time employing the same process for extracting the juice from pathogenic bacteria. Hence, Hans Buchner contends, Koch can not claim priority over him.

The Ethics and Economics of Proprietary Preparations.

Dr. Charles Rice, a member of the Committee of Revision of the United States Pharmacopœia and the chemist of the New York department of public charities, has lately thrown a good deal of the light of common sense on the question of the advisability of using proprietary preparations says the N. Y. Med. Journ. What he says is in the form of a report to the committee on the apothecary's department of the medical board of Bellevue Hospital, made in compliance with a request from that body. The report was adopted by the medical board on April 1st, and has been approved by the board of commissioners.

Dr. Rice defines a proprietary article as one of which some person or persons have exclusive control of the production, sale, or use — of all three of these features in some cases, of one or two of them only in others. He divides such articles into natural and artificial products, and again into these three classes: 1. Products of nature prepared under patents and mostly sold under copyrighted names. 2. Products of nature that have never been made under patents or are no longer so made, but are sold under copyrighted names. 3. Artificial preparations sold under copyrighted names. As regards patented articles, it is a principle in patent law, says Dr. Rice, that a product of nature can not be patented; hence no patent is granted on any chemical substance of a definite and constant composition, even though it may, at the time when the patent is applied for, not yet have been found occurring ready-formed in nature. But any process, not previously known or used, by which such a product can be formed is patentable. Certain articles that are made by patented processes may also be made by processes that are not patented, and, as it is impossible for the purchaser to distinguish by which process they have been made, nobody, says Dr. Rice, would think of raising any objection against their use in medicine. As an example, he mentions salicylic acid, which, in the form of methyl salicylate, exists in oil of wintergreen and some other volatile oils, from which the acid may readily be prepared; but, as these oils would be utterly inadequate to supply the demand, more than ninety-five percent. of the salicylic acid used in medicine is produced by a process that was patented in 1874, but on which the patent has now expired. A patent, says Dr. Rice, not only does away with all secrecy—which is usually considered the objectionable feature of a proprietary article—but it commonly acts also as a sort of guarantee of the uniformity of the product in composition, strength, aud purity.

Dr. Rice thinks that if all these points are taken into consideration, it will probably be conceded that, if an article is protected by a patent alone—the feature of a copyrighted name being disregarded—it becomes practically impossible to separate patented substances into classes of which one may and the other may not be used without a violation of ethics, and therefore none of these articles should be rejected for the reason alone that they are patented. He then proceeds to concider the three classes of proprietary articles previously mentioned.

As to products of the first class, inasmuch as copyrights on names never expire, whereas a patent has a definite term of years to run, it is evident, says Dr. Rice, that the proprietors of the copyrights would have a perpetual monopoly unless, after the expiration of the patents, other producers should put the same articles on the market under new names not copyrighted. All these bodies—such as antipyrine, aristol, phenacetine, salol, salophene, sulphonal, trional, and vanillin (the last-named substance being now sold only under its proper chemical name)—will undoubtedly, Dr. Rice thinks, be rescued from their present monopolistic control when the patents on them have expired. There is no secret whatever about them, he says. They are definite chemicals of known composition and properties, and, since some of them have been found to have real therapeutical value, no objection, it is believed, will be raised against the whole class.

Dr. Rice next considers the products of nature which have never been or are not now made under patents, but are sold under copyrighted names, familiar examples of which are antifebrine (acetanilide), dermatol (bismuth subgallate), formalin or formal (formaldehyde), pyrozone (hydrogen-dioxide solution), diuretin (sodium-theobromine salicylate), and lanolin (hydrous wool fat). The owner of the copyrighted name, he remarks, usually professes that his product is "purer" or "more refined" than the article found on the market under the common name, and this pretension, he says, is true in some instances, particulary in those of articles first put on the market under copyrighted names, although at present the best grades of the several articles sold under their common names appear to answer every purpose. These products, he thinks, are unobjectionable, but he says it seems preferable, as it is certainly more economical, to order them under their common names, especially acetanilide, bismuth subgallate, and formaldehyde.

His third class, preparations that are not products of nature, sold under copyrighted names, Dr. Rice divides into three groups. The first group, which he considers unobjectionable, comprises preparations the origin and composition of which are not kept secret, such as ichthyol, creolin, Mellin's food, malted milk, etc. The second group, which he thinks to be of doubtful value, includes all the preparations of the class that do not belong to either the first or the third group, which last, by far the largest, consists of the "secret nostrums," such as "soothing syrups," "female regulators," "blood-purifiers," etc.

Bibliography.

The second edition of Guenther's Handbuch der Geophysik is about to appear in 10 Lieferungen. It is published by Ferdinand Enke of Stuttgart.

Longmans, Green & Co. have a new edition of Mendeléeff, The Principles of Chemistry, in the press. It is translated by George Kamensky of St. Petersburg and edited by A. J. Greenaway.

Manipulations de Chémie by L. Étair, Chef des travaux chimiques à la Faculté des sciences de Paris; and Traité élémentaire de Chémie biologique, pathologique et clinique by R. Engel, Professor at the École Centrale, and J. Moitessier, associate Professor of Chemistry of the Faculty of Medicine at Montpellier, are two new books published by J. B. Baillière Fils of Paris.

A. Hartleben of Vienna calls attention to volume one of a new three volume work on Angewandte Elektrochemie by Dr. Franz Peters; also to Handbuch der Mass-Analyse by Dr. Wilhelm Bersch. The first constitutes vol. 47, of the Elektrotechnische Bibliothek by the same publisher.

Elements of Chemistry by Rufus P. Williams, Instructor in Chemistry of the English High School, Boston, is to be ready this month, whereas An Introductory Course in Quantative Analysis by Percy N. Evans, Associate Professor of Chemistry in Purdue University, is in course of preparation. Both books are published by Ginn & Co.

Julius Springer announces as in the press the following works in the third edition of Analyse der Fett- und Wachsarten by Prof. Dr. Rudolf Benedikt; Anleitung zur chemisch-technischen Analyse, for the use of university and college laboratories, by Prof. F. Ulzer and Dr. A. Fraenkel; Anleitung zur quantitativen Bestimmung der organischen Atomgruppen by Dr. Hans Meyer.

The Hausschatz des Wissens is a library of science, art and history published by J. Neumann and edited by a number of specialists. It is written in a popular-scientific style and highly illustrated. Volume seven, dealing with the vegetable kingdom, is reviewed on p. 123. Volumes 3 and 4, constituting a treatise on physics, vol. 5 on chemistry, vol. 6 on the mineral kingdom and vols. 10 and 11 on Länder- und Völkerkunde are in preparation. Although each division constitutes a unit by itself, the entire series will be provided with a general index given free of charge to the purchasers of the entire collection. It is intended that from three to four volumes shall appear annually.

Catalogues received:

Librairie J. B. Baillière et Fils—Paris. Nouvelle publications. May 1897.

Martin Boas—Berlin. Katalog No. 31 des medicinischen Antiquariats. 1897.

Ginn & Company—Boston. Catalogue and Announcements. 1897.

A. Hartleben's Verlag—Vienna. Nachtrag vom Jan. 1896 bis Dec. 1897; Verzeichniss von gewerblicher und technischer Fachliteratur, Chemisch-technische Bibliothek.

Lemcke and Buechner—New York. Monthly Bulletin of World Literature. 1897, No. 3.

Longmans, Green & Co.—New York. Reference works and text-books in Chemistry.

Commercial.

Production of Iodine.

According to the C. & D. the Iodine Syndicate have been more than usually troubled of late with the arrival on the London market of parcels not controlled by them. New iodine works have lately been started in Norway and in Japan, and the number of free iodine producers on the west coast of South America is also increasing every year. Japan, which has until recently been the chief customer for European iodides, has begun to manufacture those preparations for herself from iodine recovered from the algæ that abound on her coasts. With her abundance of low-priced labor Japan will, in all probability, not only succeed ere long to free her home market from the foreign article, but she may begin to export iodine, and even iodine preparations, to Europe and America. Small isolated consignments of such goods have, in fact, already made their appearance in the British market. When the new Japanese industry began to assert itself about a year ago, the European makers made great effort to crush it and keep the Japanese market to themselves by reducing their prices. The Japanese makers, however, proved to strong for them, and at the present time that once important outlet may be regarded as a lost market.

According to our dailies the new Secretary of Agriculture has suggested the manufacture of iodine from algæ as a new industry for this country. At present this appears more like a politicial effort to secure better times on paper than like a fact to be accomplished.

Reports and Catalogues received:

Fritzsche Brothers—New York. Semi-annual report of Schimmel & Co. April 1897. Pamphlet, pp. 120.

Gehe & Co.—Dresden-Neustadt. Handelsbericht, April 1897. Pamphlet, pp. 86.

Heinrich Haensel—Pirna a. d. Elbe. Bericht über das erste Vierteljahr 1897. Pamphlet, pp. 31. Extract from quarterly report on essential oils and fruit essences. April 1897. Pamphlet, pp. 23.

E. Merck—Darmstadt. Annual report on the year 1896, published in March 1897. Pamphlet, pp. 187.

If you have a case of

Anaemia

or of any condition of waste and debility use

Protonuclein.

Protonuclein as a tissue builder is without an equal. It stimulates the nutritive functions, increases resistance to disease, promotes glandular secretion, restores tone to the system; cell life throughout the organism is stimulated and health augmented.

REED & CARNRICK, New York.

SUPPLEMENT, JULY 1897.

Scientific Organizations.

Calendar of State Pharmaceutical Associations.

Name.	Date.	Place.	Secretary.
Maine	July 6	Portland	M. L. Porter, Danforth.
Maryland	July 14-16	Ocean City	Henry Maisch, Baltimore.
New York	July 13-16	Manhattan Beach	J D. Todd, Ithaca.
South Dakota	July 20-22	Sioux Falls	I. A. Keith, Lake Preston.
Tennessee	July 21	Nashville	R. W. Vickers, Murfreesburo.
Michigan	Aug. 3	Lansing	Ben. Schroeder, Grand Rapids.
Minnesota	Aug. 23-24	Lake Minnetonka	C. T. Heller, St. Paul.
Wisconsin	Aug. 10	Green Bay	E. B. Heimstreet, Janesville.
New Hampshire	Sept 7 & 8	Manchester	F. L. Way, Manchester.
Oregon	Sept	The Dalles	A. W. Allen, Portland,
South Carolina	Nov. 14	——	J, A. Barbot, Charleston.

Bureau of Weights and Measures.

The biennial session of the International Committee on Weights and Measures* was held in the Pavillon de Breteuil, April 13, under the presidency of Professor Foerster of Berlin. The other foreign members present were Arndtson of Christiania, v. Bodola of Budapest, Chaney of London, Hirsch of Neuchâtel, Hepites of Bukarest, v. Lang of Vienna, de Macedo, the Portugese ambassador, and Mendeleeff of St. Petersburg. According to the Chemische Rundschau, the bureau submitted several very interesting dissertations: one on the exact determination of the normal measures of the centimetre and millimetre by the Director Benoyt; another on the discovery of a new alloy of iron and nickel by Dr. Charles Guillaume of Neuchâtel. This new alloy expands less than any of the known metals or alloys (1/10 of that of platinum) and consists of 36 parts of nickel and 64 parts of iron. For measuring apparatus and machines, which are exposed to changes in temperature, this discovery is of great importance.

University of Nancy.

It is reported (C. & D.) that the well-known manufacturers, M. M. Solvay & Co., have donated the sum of 100,000 francs to assist in the development of the chemical institute. An iron-works has given 10,000 fr., two glass-manufacturers have sent similar sums, and smaller amounts have also been contributed. It would seem that French manufacturers, like the English, are realizing the necessity of live scientific institutes such as Germany has long possessed.

According to the Ph.-Ztg., Nancy is to have a physico-chemical laboratory, established by the municipality, which will give especial attention to electrical subjects. Manufacturers in the north-eastern part of France are reported as being enthusiastic over the project and as having subscribed liberally as indicated above.

Pharmaceutical Society of Great Britain.

The 56th annual meeting of this society, which represents the commercial and general professional interests of British pharmacy, but leaves pharmaceutical science to the Pharmaceutical Conference, met in the month of May. On account of the character of this association its deliberations are naturally principally of local interest. The order of business of greatest interest was the one which involved a rise in the examination fees. It was carried. There are only a few organizations in this country which stand in similar relation to the communities they represent.

Catalogues received:—

Philadelphia College of Pharmacy—Seventy-seventh announcement.

University of Iowa—Iowa City. Thirteenth annual announcement of the Department of Pharmacy. 1897–98.

University of Wisconsin—Madison. Catalogue for 1896—97.

Vanderbilt University — Nashville, Tenn. Announcement of the Department of Pharmacy for 1897—98.

History.

Some Historical Traditions about Gun Powder.

Prof. W. Le Conte Stevens of the Rensselaer Polytechnic Institute in an article on the Evolution of modern heavy gun in the June Popular Science Monthly makes the following statements about the discovery of the well known explosive:—

There is no probability that we will ever learn definitely the true history of the invention of gun powder. Quite probably it was independently invented by different persons at different times. There can be little doubt that the knowledge of its composition existed at a very early date among some of the inhabitants of India, where the rich soil under a tropical sun has during many centuries been leached for the purpose of procuring niter. Assuming the presence of this salt in abundance, it would hardly be possible for one who handles it to remain long ignorant of its capacity to explode when sufficiently heated in contact with charcoal, sulphur, or any other kind of fuel. It is not surprising that some of the earlier alchemists should be credited with the preparation of gun powder. It has been common to attribute its invention to Roger Bacon, whose life lasted through the greater part of the thirteenth century. But his language is characteristically vague; for, in regard to the mixing of saltpeter with sulphur and another undefined substance, he merely says: "You will thus make thunder and lightning if you know the method of mixing them."

Another claimant to the invention of gun powder was the German monk, Berthold Schwartz, who is said to have ground together in a mortar a mixture of niter, charcoal and sulphur. Accidentally allowing fire to come in contact with the mixture, an explosion ensued.

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* For general information about this committee and the Pavillon de Breteuil see p. 97 of vol. 14 of this journal.

The pestle was projected from the mortar and from the hand of the surprised alchemist. This suggested the use of the uncanny substance for military purposes, and the mortar was subsequently made on a larger scale for the special purpose of propelling projectiles.

The determination of the proper percentages of niter, carbon and sulphur in gun powder implies a knowledge of the quantitative laws of chemistry. It is not to be supposed, therefore, that the earlier users of this explosive were able to make powder equal in quality to that of modern times, or that they knew how to adjust its granulation to the special purposes intended under varying circumstances. The Saracens seem to have introduced it into Spain for pyrotechnic purposes about the same time that Schwartz made his suggestion regarding its most important practical application. Its first definitely known use was for cannon. These were called "bombards," on account of the noise occasioned by firing.

In Memoriam.

K. R. Fresenius.

Karl Remigius Fresenius, the nestor of analytical chemistry, is reported to have died in the night from the 10th to the 11th of June, evidently at his home in Wiesbaden.

He was born on the 28th of Dec., 1818, in Frankfurt on the Main. In 1836 he entered pharmacy and at the same time the Senkenbergische Institut in Frankfurt. Later he studied chemistry at Giessen, became Liebig's assistant in 1841 and in 1843, at the age of 25 became Privotdocent. In 1845 he went to Wiesbaden as Professor of Chemistry at the Agricultural Institute. Three years later (1848) he established his own Chemical Laboratory, which soon became world famous. In 1862 a pharmaceutical department, in 1868 an agricultural-chemical department, and later departments of bacteriology and hygiene were added.

As early as 1842, while in Liebig's laboratory, he began his active literary career with his Anleitung zur qualitativen chemischen Analyse. His books on analytical chemistry are too well and too universally known to require comment. The Zeitschrift für analytische Chemie, established by him in 1862, is probably somewhat less generally known. With the death of Fresenius a remarkable character has stepped off the chemical arena. His sons evidently intend to continue his work.

Emily L. Gregory.

Dr. Emily L. Gregory, who died April, 21, 1897, was one of the first American women to receive the degree of Doctor of Philosophy from an European university. She was born Dec. 31, 1841. She received her preparatory education at Albion Seminary and her collegiate education at Cornell University, from which institution she graduated in 1881. Two years later, she went abroad to study, spending two years at Strassburg and the following one at Zürich. At the latter place, she received her degree in 1886. Dr. Gregory was two years (1881–1883) at Smith College as teacher of botany. The next year she had charge of the botanical laboratory at Harvard Annex. After her return from Europe she was two years at Bryn Mawr as associate in botany, after leaving there she was at the University of Pennsylvania a few months. In 1889, she was appointed instructor in botany in Barnard College, in which institution she remained until the time of her death, having been promoted to the rank of full Professor of Botany in 1896. Without doubt, Barnard College owes much of its success to her attractive personality.

Julius von Sachs.

The man who has filled perhaps the most prominent position among the world's botanists of the present time, Julius von Sachs, died on the 28th of May at Würzburg at the age of 65 years.

Prior to his times, botany had found its chief development along systematic and anatomical lines, the problems of plant physiology having received but a limited notice. Sachs may be said, well nigh single handed to have turned the drift of continental botanical research from these traditional courses, mainly through his Handbuch der Experimental-Pflanzenphysiologie, published in 1865. It is probable that Sachs' attention was directed to this line through his early training in animal physiology, received under the great anatomist and physiologist, Purkynje, during his service in the University of Breslau. When in 1850, his teacher was called to Prague, Sachs went with him as his private assistant. Thus equipped with the best physiological methods and ideas of the time, Sachs turned to botany, more especially to the physiology of plants, and, by a series of remarkable treatises did much toward placing our knowledge of the vital phenomena of plants on a scientific basis. In 1868, his Lehrbuch der Botanik appeared, the highest authority of its day and still indispensible to the botanist. In 1882, his Vorlesungen über Pflanzenphysiologie was published. In this work was summarized the most important physiological knowledge, not a small part of which, he himself had gained.

Not only in pure botany has Sachs won the gratitude of all students in the biological sciences. His Geschichte der Botanik brought down to almost 1860 is no mere chronicle of the progress of the science. It is a deeply philosophic discussion of causes operative and must ever remain a classic in its field.

Sachs was born in 1832 in Breslau. In 1859, he entered on his career as a teacher. At first assistant in Tharandt, he was called in 1861 to Poppelsdorf as professor, in 1867 to Freiburg. In 1868, he accepted the responsible station at Würzburg of Professor of Botany, and of Director of the Botanical Institute, of the Botanical Garden and of the Herbarium, in which capacity he served until his death.

Ernst Jahns.

On April 17. Ernst Jahns, apothecary in Goettingen, died at the age of but 53. Though he was in the practical pursuit of his calling, yet the deceased found it possible not only to follow the progress in our science, but also to furnish valuable contributions by original research. His work furnishes a good illustration, showing that even at the present time valuable scientific results are attainable with moderate experimental resources, if only the right love of science is at work. The following biographical notes were received by the secretary of the German Chemical Society from a friend.

Jahns was born Feb. 27, 1844, at Hannover. After attending the gymnasium there, he served his apprenticeship until 1863 with the Berg-Commissär Hildebrandt in Hannover. While with this man of general knowledge, Jahns laid a good foundation in chemistry and botany, upon which he continued to build during the following years in service. Jahns received special incentives to botanical studies during a stay of some length of time at the Staats-Apotheke in Bern, which was then conducted by that excellent pharmacognoist Flückiger. During 1867 and 1868 Jahns studied at Goettingen and there in 1873 he acquired the University Apotheke, in which he had been an apprentice some years before.

In the laboratory of this Apotheke we find him until recently untiringly and successfully engaged in experimental investigations of plant substances, the results of which he reported partly in the Archiv der Pharmacie and partly in the Berichte d. d. Chemischen Gesellschaft.

In one of his first investigations he discovered the presence of carvacrol in origanum oil or "Cretisch-Dostenöl", which, as is known, is to-day the most abundant source for the derivation of that phenol; to our knowledge of volatile oils he also contributed later by his investigation of thuja oil and eucalyptus oil, in which latter investigation he shows the identity of eucalyptol with cineol. He made an excellent investigation of the constituents of galanga root; showing that what had been considered as one substance under the name of kämpferid, is a mixture of three, naming them kaempferid, galangin and alpinin, and characterizing them in a model manner. However, the best fruits of his scientific labors were born in the field of the alkaloids. In 1885 he discovered trigonelline in fenugreek; two years later he reports that he finds this base to be identical with the methylbetaïn of nicotinic acid, discovered by Hantsch shortly before. During the last years he was principally engaged with the alkaloids of the areca nut. In his work upon these problems it is plainly discernible how Jahns continued to perfect himself in the use of chemical methods. Here also he was successful, by exact observation and fortunate combination, in completing the analytical investigation of the most important constituent, that of arecoline, finding the base to be N-methyltetrahydronicotinic acid-methylester.

Besides his business pursuits Jahns did not only find time for the above mentioned comprehensive chemical investigations, but also continued to preserve interest in botany. An excellent and very extensive herbarium, to which he had never ceased to add, will serve as evidence for this.

Bibliography.

Julius Springer announces as just out a work by Dr. C. S. Schleich, entitled Schmerzlose Operationen; örtliche Betäubung mit indifferenten Flüssigkeiten; Psychophysik des natürlichen und künstlichen Schlafes.

The same publisher announces the completion of Der Verkehr mit Arzneimitteln und Giften ausserhalb der Apotheken by Dr. Franz Nesemann. Although this work may be of little interest to the average American, those, who are at present interested in the nationalization of pharmaceutical legislation or in the revision of state pharmacy laws may find useful information.

The early editions of Rammelsberg's Leitfaden für quantitative Analyse were reviewed in the older volumes of this journal. The fifth revised or rather "gänzlich umgearbeitete" edition by Prof. Carl Friedheim has appeared under the title Leitfaden für die quantitative chemische Analyse and includes volumetric analysis, gas analysis and electrolysis. The publisher is Carl Habel of Berlin.

The Zeitschrift für angewandte Mikroskopie, the first volume of which was reviewed on p. 240, vol. 14 of this journal, is published by Carl Steinert of Weimar since April of this year. The editor is G. Marpmann.

The sixth edition of the Inorganic Chemistry of Gmelin-Kraut's Handbuch der Chemie has recently been completed. It is edited by Prof. Dr. A. Hilger with the aid of several collegues. A complete alphabetical index is in preparation. It is published in Carl Winter's Universitätsbuchhandlung in Heidelberg.

Dr. Faber has compiled a handbook entitled Schutz, Hilfe und Beistand. It is a popular treatise and treats 1) of the anatomy of the human body; 2) of first aid to the injured; 3) of maternal duties and the treatment of infants; 4) of house gymnastics for the healthy and invalids. It is published by Geo. Brumder of Milwaukee.

The Zeitschrift für Bücherfreunde contains the following notice of interest to pharmacists, whether bibliophiles or not: — Among the numerous curiosities recently sold at auction in Paris there was a small volume bound in an Italian renaissance cover and bearing the code of arms of Katharine de Medici. It is a medico-chemical tract dealing with the preparation of poisons. Those paragraphs giving information about the means by which a human being could be expedited quickly to another world, were underlined and provided with glossaries in an old handwriting. Whether the handwriting was that of the queen or not, could not be determined.

The Pharmacologist is a new quarterly published by Frederick K. Stearns of Detroit and "devoted to the consideration of drugs from scientific and commercial points of view." The journal, is, no doubt, unique in the distinction it makes between scientific and commercial. For the scientific department it will receive contributions "from both professional and trade sources, whether the contributor is interested financially in the subject or not, so long as they treat of drugs and preparations not restrained from general use by patents, so-called trade-marks, or secret methods of manufacture." For the commercial department the publisher solicits "communications concerning drugs and preparations restrained from general use by trade methods." Whatever ethical view may be taken of such preparations, the fact must be recognized that they are extensively used and that physician and pharmacist want to be informed with regard to them. Inasmuch, however, as the manufacturer is financially benefited by spreading such information, he is expected to bear a part of the expense of publication. In other words, the articles of this department are unveiled reading notices. This is certainly honest, even if deplorable from the standpoint of those who are trying to change the views of the medical and pharmaceutical professions with regard to patents. Aside of the intrinsic value of the information contained in this journal, its development will be of interest to many thinking persons.

Catalogues received:—

Lemcke & Buechner—New York: Monthly Bulletin of world-literature. 1897, No. 4.

Commercial.

Profits of German Chemical Manufacturers.

The following annotation is from the P. J.: The Farbenfabriken (Friedrich Bayer & Co.), of Elberfeld, made a profit last year of $1,334,000.00 and has just paid a dividend for the year of 18 p. c. The Badische Anilin- und Soda-Fabrik of Ludwigshafen, on the Rhine, had a profit of $2,004,690, and has distributed 26 p. c.; and Messrs. Meister, Lucius & Bruening, of Hoechst a. M., came out with $1,707,775 to the good, and have been enabled to return 28 p. c. These several results were accomplished in spite of injury done by the presidential election in America and by the famine and plague in India.

No one can be surprised at the ever increasing business of these German firms who has made acquaintance with their murderous energy etc. They employ large staffs of highly trained chemists who spend their time on novelties and the improvement of existing products. It is stated that Germany sent to the United States during the twelve months ending last June 9,763,000 lbs. of alizarin against 308,743 lbs. sent by England, while of coal-tar colors and dyes the imports from Germany were valued at $2,324,157, and those from Great Britain at $191,263.

Catalogues and Pamphlets received:—

C. F. Boehringer & Soehne—New York. Ferratin. Pamphlet, pp. 16; Lactiphenine, or lactyl-para-phenetidine, an antipyretic, analgesic and sedative. Pamphlet, pp. 16.

Lehn & Fink—New York. Facts relative to the treatment of diseases of the upper air passages. By Dr. H. L. Armstrong. Pamphlet, pp. 6.

Parke, Davis & Co.—Detroit. Bacteriological products from the biological department.

—— Prices current: Bacteriological and biological products.

Roessler & Hasslacher Chemical Co.—Price list, May 1897.

E. Schering—Berlin. Eucaine A, a new local anaesthetic. Pamphlet, pp. 24.

ARE YOU USING

Peptenzyme?

Peptenzyme

Is the only perfect digestant.

Digests every kind of food, albumen, fat, starch, cane sugar, reducing them to the exact conditions required for assimilation in the organism.

Presents in physiological activity the digestive principles, active and embryo ferments, from all the digestive glands.

Is the only preparation which contains the enzymes isolated by a mechanical process, and unchanged from the condition as found in the living gland.

Peptenzyme is far superior to any other preparation in the treatment of all disorders of the digestive organs. It promotes digestion, both by aiding and perfecting the process itself, and by stimulating the appetite and secretory functions through the absorption of the embryo ferments. It not only gives immediate relief, but aids in **curing** Dyspepsia, etc. Pepsin, as found in the market, is prepared only by chemical methods, and has consequently lost most of its physiological properties, and is of little service in aiding digestion.

Peptenzyme is prepared in three forms, Elixir, Powder and Tablets.

SAMPLES, LITERATURE AND DIET LEAFLETS UPON REQUEST.

REED & CARNRICK, NEW YORK.

SUPPLEMENT, AUGUST 1897.

Universities and Colleges.

University of Michigan.

At the fifth-third annual commencement, Thursday July 1., the degree of Pharmaceutical Chemist was conferred upon 21 candidates and that of Bachelor of Science in Pharmacy upon three. The honorary degree of Master of Pharmacy was conferred upon Maurice A. Miner, Ph. C. of the class of 1871.

University of Wisconsin.

The special exercises of the School of Pharmacy were held Monday evening, June 21. The principal features of the program were an address by Dr. Wm. Trelease on Medical and Pharmaceutical Botany; and the presentation of the portrait of Dr. F. B. Power on part of the pharmaceutical alumni who studied under him during the years 1883—1892. Dr. Trelease was Professor of Botany at the University when the School of Pharmacy was established in 1883, but since 1885 has been Director of the Missouri Botanical Garden at St. Louis.

Chicago College of Pharmacy.

This college which a year ago affiliated itself with the State University of Illinois makes the following special announcement:—The degree of Pharmaceutical Chemist will be conferred as heretofore, but for a more extended course, the details of which will be announced later. In conformity with the common usage of schools of pharmacy, drug-store experience will not be required for this degree.

Northwestern University School of Pharmacy.

The chairs vacated by the resignations of Professors Kraemer and Nagelvoort are to be filled respectively by Dr. Albert Schneider and by Mr. David S. Davoll.

Dr. Schneider was born in 1865 and received his college education at the Universities of Minnesota and Illinois and at Columbia University, the last conferring upon him the doctor's degree. He had also graduated in medicine in 1887. His special field is general botany, but during the past year he has also given attention to pharmacognosy having made a series of histological studies for one of the research committees of the U. S. P. Revision Committee.

Mr. Davoll is a graduate of the University of Michigan. For two years he acted as assistant at Ann Arbor and then for a year in the research laboratory of Parke, Davis & Co. A year ago he returned to Ann Arbor as instructor. His postion in Chicago will be that of Assistant Professor of Applied Pharmaceutical Chemistry.

Catalogues received:—

Brooklyn College of Pharmacy—Seventh annual announcement. 1897—98.

Chicago College of Pharmacy—Thirty-eighth annual announcement. 1897—98.

College of Pharmacy of the City of New York—New York. Prospectus 1897—98.

Eclectic Medical Institute—Cincinnati. Fifty-third annual announcement 1897—98.

Massachusetts College of Pharmacy—Boston. Thirty-first annual announcement.

National College of Pharmacy—Washington, D. C. Twenty-sixth annual circular, session of 1897—1898.

Northwestern University School of Pharmacy—Chicago. Circular of information for 1897—98.

Ontario College of Pharmacy—Toronto, Canada. Annual announcement, 18th session. 1897—98.

University of Iowa Department of Pharmacy, Iowa City. Thirteenth annual announcement 1897—98.

University of Michigan School of Pharmacy—Ann Arbor. Annual announcement and register of alumni. Thirtieth year, 1897—98.

The Pharmaceutical Era—New York. The Era course in pharmacy.

Scientific Societies.

International Congress on Technical Education.

This congress was opened at the Society of Arts, Adelphi, on Tuesday, June 15, the Duke of Devonshire presiding, after M. Léo Saignet, the retired President, formally gave up his office. The Duke of Devonshire explained that the meeting of the congress in London was due to the Society of Arts and to the city companies, which had guaranteed the needed expenditure. He then dwelt on the benefit to be derived from such gatherings and on the changes English education had undergone due to continental influences.

Prof. O. N. Witt read the first paper in which he advocated a thorough grounding in pure chemistry as the best training for future work. Prof. H. E. Armstrong read a paper on an allied subject, and Dr. J. H. Gladstone followed with one on teaching chemistry in continuative evening schools, stating that in Manchester there were arrangements for 12,451 pupils at evening schools, and that 2,738 are attending practical chemistry laboratories. Prof. G. Lunge, in a paper, stated that to raise Englich chemical industry to the foremost rank, it was necessary that the technical management of chemical factories should not be left in the hands of rule-of-thumb men, but should be entrusted to real chemists. These men should have a much fuller education than the majority of chemists seem to obtain in Great Britain at present. To him it also seemed a great waste of time and means to give some superficial chemical teaching to tens of thousands of workmen on the remote chance that one might have some real benefit of it.

Calendar of State Pharmaceutical Associations.

Name.	Date.	Place.	Secretary.
Michigan	Aug. 3......	Lansing.........	Ben. Schroeder, Grand Rapids.
Minnesota	Aug. 23-24	Lake Minnetonka	C. T. Heller, St. Paul.
Wisconsin	Aug. 10....	Green Bay	E. B. Heimstreet, Janesville.
New Hampshire..	Sept 7 & 8	Manchester ...	F. L. Way, Manchester.
Oregon................	Sept.........	The Dalles	A. W. Allen, Portland,
South Carolina...	Nov. 14....	—	J, A. Barbot, Charleston.

History.

Percolation.*

We observe that the American Druggist claims for the United States the credit of first making percolation an official process—viz., in the 1840 edition of the U. S. P., published in 1842. This is how our contemporary puts the matter finally:—

The early introduction and the general utilisation of percolation into the Pharmacopœia of the United States, and the excellent and exhaustive study given the process here, surely justifies the claim that percolation, as now practised, should be looked upon as a distinctly American process, though, so far as we are aware, it is a French invention.

It is a common but quite erroneous notion, that percolation is "a distinctly American process". American pharmacists have written a lot about it, but they must give the palm to Scotchmen for being the first to recognize its utility and make it an official process. In the Edinburgh Pharmacopœia of 1840 (published in 1839) the process was officialized under tinctures in the following terms:—

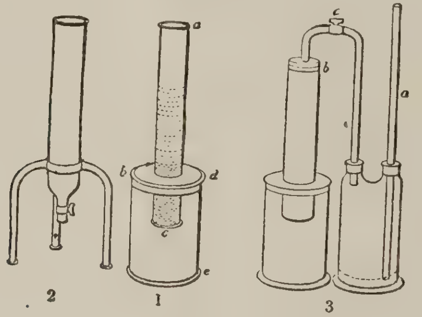

Fig. 1, percolator as contemplated by the Edinburgh Pharmacopœia, covered with calico at *c* and fitted into the jar, *e*, with cork or wooden lid, or the percolator may have attached to it the broad rim, *b d*. "It is sometimes advantageous," says Christison, "to contract the lower end so as to admit of a stop-cock on it, fig. 2." The percolator fig. 3 was for pressure-percolation, mercury being poured into *a* when the operation was started.

"A much superior method has been lately introduced, which answers well for most tinctures—namely, the method of displacement by percolation. According to this process, the solid materials, usually in coarse or moderately fine powder, are moistened sufficiently with the solvent to form a thick pulp. In twelve hours, or frequently without any delay, the mass is put into a cylinder of glass, porcelain, or tinned iron, open at both ends, but obstructed at the lower end by a piece of calico or linen, tied tightly over it as a filter; and the pulp being packed by pressure, varying as to degree with various articles, the remainder of the solvent is poured into the upper part of the cylinder, and allowed gradually to percolate. In order to obtain the portion of the fluid which is kept in the residuum, an additional quantity of the solvent is poured into the cylinder until the tincture which has passed through equals in amount the spirit originally prescribed. [The displacing of the residual spirit by water is then described.] The method by percolation, where applicable, will be found much more convenient and expeditious than the mode hitherto commonly followed; and it exhausts the matters in general much more completely. As considerable practice, however, is required for managing the details in different cases, more especially in regard to the degree of minuteness in the division of the solids, and the degree of firmness with which they are to be packed in the cylinder, we have thought it right to direct that the method by maceration may be employed as an alternative. But the method by percolation is now preferred by all who have made sufficient trial of it to apply it directly."

This reads like an extract from a modern American manual of pharmacy. There is every reason why the Edinburgh Pharmacopœia should have been the first to adopt the process; Scotch brewers had long used it under the term "sparging," and when Boullay and his son published their papers on displacement applied to the exhaustion of drugs in 1833–34, the Edinburgh College recognized the appropriateness of the process for medicinal purposes. Christison (Dispensatory, 1842) gives the preceding sketches of percolators and a very full description of the process. The Edinburgh Pharmacopœia named the tinctures which could not conveniently be prepared by percolation, as well as those which could be. We need name the latter only:—

Aurantii
Buchu
Calumbæ
Cantharidis
Capsici
Cardamomi
Card. co.
Cascarillæ
Cassiæ
Castorei
Catechu
Cinchonæ

Cinchon. co.
Cinnamomi
Cinnam. co.
Colchici sem.
Conii fol.
Croci
Cuspariæ
Digitalis
Gallarum
Gentian. co.
Hyoscyami
Jalapæ

Lactucarii
Lobeliæ
Lupuli
Myrrhæ
Quassiæ co.
Rhei
Scillæ
Sennæ co.
Serpentariæ
Valerianæ
Zingiberis

This was a fairly good beginning for a new process. The fact that the London Pharmacopœia did not adopt the process during the sixteen years following the Edinburgh move must not be taken to mean that the process was not appreciated in England, because one of the first papers communicated to the Pharmaceutical Society in 1841 (by Mr. Henry Deane) was on this subject, and one effect of that paper was to bring out the fact that percolation had been practiced by English pharmacists for years. We have no desire to belittle the excellent work in percolation which American pharmacists have done, but before the century dies it might be well for British pharmacists to remember that they and their forefathers have been percolating officially and unofficially for sixty years, although they have not made much fuss about it.

History of Alcohol.

That druggists played an unenviable part in the liquor question a century and a half ago as well as to-day is brought out in the continuation of C. E. Pellew's article on the History of Alcohol which appears in the July number of Appleton's Popular Science Monthly.

The famous "Gin Law," passed in 1736, is interesting as the earliest severe blow at liquor dealing among civilized nations. It levied a tax of twenty shillings a gallon on spirits, and a license of fifty pounds for any selling or dealing in it. And, being in advance of public opinion, it failed much as other, more stringent, prohibition laws have failed in our own day. For the cry was at once raised that it taxed the poor man's gin, and let the rich man's wine go free. Every wit, every caricaturist, had his fling at it. Ballads were hawked round, telling of the approaching death of Mother Gin. The liquor shops were hung with black, and celebrated unproariously Madame Geneva's lying in state, her funeral, her wake, and so on. The night before the law went into effect, so the contemporary journals say, there was a universal revel all over the country. Every one drank his fill, and carried home as much gin, besides, as he could pay for.

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* From Chemist and Druggist.

To evade the law, apothecaries sold it in vials and small packages, sometimes colored and disguised, generally under false labels, such as "Colic Water," "Make Shift," Ladies' Delight." There were printed directions on some of these packages—e. g., "Take two or three spoonfuls three or four times a day, or as often as the fit takes you." Informers were very prominent and exceedingly offensive, inventing snares to catch lawbreakers for the sake of the heavy rewards, and spying and sneaking around in a way particularly distasteful to the English mind. In consequence, they suffered in their turn. The mere cry "Liquor spy!" was enough no raise a mob in the London streets, and the informer was lucky to escape with a sound trashing and a ducking in the Thames or the nearest horse pond. Indeed, such an outcry was made about the matter that the ministry became very unpopular, und the law was not enforced after two or three years, and was largely modified in 1743, after seven years' trial.

In Memoriam.

Victor Kostka.

Victor Kostka, for several years president of the New York German Apothecaries Society, died July 5, at the age of forty-six. Mr. Kotska was a native of Posen, Germany, where he served his time as apprentice and assistant. He came to New York about 25 years ago and for a number of years has figured prominently among the German pharmacists of that city.

Professor Schuetzenberger.

Professor Schuetzenberger, the French chemist, died June 25, at an age of about 67 years. He was born in Strassburg, Dec 23, 1829. He studied medicine in his native city and took his doctor's degree in 1855. He commenced his career as a chemist in the chemical laboratory of the Conservatoire des Arts et Metiers. After having held several positions as teacher of chemistry he was appointed Professor of Chemistry at the College de France in 1876. He was also director of the Municipal School of Physics and Chemistry. Since 1884 he was member of the Academy of Medicine, in the Section of Medical Chemistry; and in 1888 he was chosen to fill the seat of the chemist Debray at the Academy of Sciences. Besides being a teacher he was an author and investigator. The vegetable alkoloids were his field during the last year.

P. C. Plugge.

Dr. Pieter Cornelis Plugge, Director of the Pharmaceutical Laboratory of the University of Groeningen, and Professor of Pharmacy and Toxicology in the same university, died on Wednesday, June 30, at Buitenzorg, Java. He had been sent to the Royal Gardens there on a scientific mission by the Dutch government.

He was born at Middelburg, in Holland, in 1847. He received his education at his native town and at the Athenaeum at Amsterdam. In 1868 he passed his pharmaceutical examination, and for the next eight years he acted as assistant in Amsterdam and Groeningen. In 1876 Dr. Plugge was appointed director of the pharmaceutical laboratory at Tokio, and adviser to the Japanese government on questions of hygiene and chemistry. After two years he returned to Groeningen to take the chair of pharmacy and toxicology. An important pharmaceutical laboratory was built under his direction and here he did most of his well known scientific work on the alkaloids. His book on the variations in the chemical composition and pharmaco-dynamic value of certain important remedies was translated into German by Professor Schaer in 1886.

Personals.

Professor Virgil Coblentz is spending part of his vacation at work in the laboratory of Prof. A. Hilger in Munich.

Dr. H. H. Rusby has gone to the Royal Herbarium at Kew where he expects to work on his collections of South American plants. He has recently received the appointment of Professor of Materia Medica at the Bellevue Hospital Medical College.

The Hanbury Medal has been awarded this year to Dr. John Elishee De Vrij of the Hague, Holland. Dr. De Vrij, who by this appointment has become the ninth Hanbury medallist, is well known as quinologist having entered upon his career as cinchona specialist even before 1857 when he was sent to Java by the Dutch government.

Prof. L. S. Cheney, Professor of Pharmaceutical Botany at the University of Wisconsin, is in the northern part of the state with a staff of assistants working on the flora of Wisconsin. In addition to the collections made for the University Herbarium Prof. Cheney this year intends to work as botanist for the Natural History Survey made possible by an appropriation by the legislature of last winter.

President Morrison of the Am. Pharm. Assn. has appointed Joseph P. Remington, of Philadelphia, and Louis Dohme, of Baltimore, with Frederick B. Power, of London, and Adolph Meyer, of New Orleans, as alternates, to represent the association at the International Pharmaceutical Congress to be held at Brussels this month.

Among those knighted during the recent British Jubilee are to be found the names of Dr. Edward Frankland and Mr. William Crookes. As chemical students know, Frankland began his investigations about fifty years ago and his name has since been closely associated with the study of the paraffin hydrocarbons and their radicles. He has taught chemistry at several institutions and from 1871—73 was president of the Chemical Society. Mr. Crookes has been editor of the Chemical News for several decades, but is also an investigator. He discovered thallium in 1861 and during the last year or two his name has become quite popularly known in connection with the tubes used in X-ray photography.

Prof. J. U. Lloyd of Cincinnati, who received the degree of Master of Pharmacy at the last commencement of the Philadelphia College of Pharmacy has more recently been honored by the State University of his own state with the degree of Doctor of Philosophy.

Bibliography.

Die Fabrikation der Kartoffelstärke by Prof. Dr. O. Saare, Director of the laboratory of the Verein der Stärke-Interessenten in Deutschland, is announced as just out by Julius Springer.

Systematic botanists, in fact, all students of field botany will be delighted with the appearance of vol. two of the Illustrated Flora of the Northern States and Canada by Britton and Brown. Subscriptions may be sent to the publishers Chas. Scribner's Sons, N. Y., or to Prof. N. S. Britton, Columbia University, N. Y.

Students and lovers of ferns may be interested in The Fern Bulletin, an illustrated 16-page quarterly edited by Willard N. Clute. A sample copy may be had free by addressing The Fern Bulletin, Binghamton N. Y.

A text book of general lichenology, with descriptions and figures of the genera occurring in the Northeastern States, by Albert Schneider is announced by W. N. Clute & Co., Binghamton, N. T. Dr. Schneider, for two years Fellow in Botany at Columbia Univerity, is the recently appointed Professor of Pharmacognosy at Northwestern University.

Commercial.

The Statistische Jahrbuch für das Deutsche Reich contains some interesting information regarding the number of physicians and apothecaries. In 1887 there was one physician to every 34.16 km. square, in 1896 one to every 22.60. There was one apothecary to every 115.51 (1887) and 103.92 (1896) km. square respectively. Of physicians there was one to every 2961 inhabitants in 1887 and one to every 2187 in 1896. In 1887 there was one pharmacy to every 10,012, in 1896 to every 10,052 inhabitants. Whereas the number of physicians has increased relatively to that of the population, that of pharmacies has decreased. The ratio, however, varies considerably in different states and provinces. Whereas there has been a diminution in some places there has been an increase in others, e. g. Berlin.

Catalogues received:—

Druggist Circular—N. J. Price list, July 1897.

Fritsche Bros.—N. J. Wholesale price list, June 1897.

G. & R. Fritz—Wien. Vorzugspreise. Anfangs Juli 1897.

The Roessler & Hasslacher Chem. Co.—New York. Price list Nos. 97 and 98.

E. R. Squibb & Sons—Brooklyn. Semi-annual price list of standard pharmaceutical preparations and pharmaceutical reagents. July 1, 1897.

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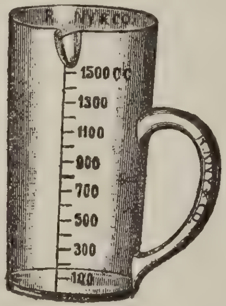

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Universities and Colleges.

University of Berlin.

Several years ago pharmacy was recognized by the University at the national German capital by the appointment of Dr. H. Thoms as Privatdocent in pharmaceutical chemistry. It is now reported that the position has been raised to the rank of a professorship.

The Experimental Field on the Brocken.

According to the Pharm. Zt. it has been reported from the Harz that Prof. Peters of Goettingen has been enabled to purchase 450 additional alpine plants and 750 conifers. The experimental field can thus be extended and experiments outside of this field will be made. For those not acquainted with this undertaking it may be well to add that Prof. Peters some years ago began to transplant an alpine flora to the Brocken, this famous mountain of the Harz, and that he appears to have met with considerable success thus far.

Cleveland School of Pharmacy.

This school which since last year gives a three year's course, of about seven months each, leading to the degree of Pharmaceutical Chemist, has further strengthened itself by the addition to its instructional force of Dr. Henry V. Arny as Professor of Pharmacy and Director of the Pharmaceutical Laboratory. Dr. Arny of New Orleans is a graduate of the Philadelphia College of Pharmacy and has spent several years in Europe, studying especially at the Universities of Goettingen and Munich. He took his degree at the former university, working under Prof. Wallach. His doctor's dissertation was duely noticed in this journal.

Prof. Beal of Scio, O., is enlisted as Lecturer on Pharmacal Jurisprudence.

A Psychological Museum.

Among the many valuable scientific collections in Florence there is, according to P. T. L. in the Nation, 65, p. 48, one that for the unique purpose of its display deserves some attention. The "Musée indien fondé par A. de Gubernatis" (mentioned in Baedecker, "Italie Septentrionale," pp. 365 and 410, ed. 1895) forms part of the Section of Anthropology in the Instituto dei Studii Superiori, and chiefly exists for its ethnological and anthropological interest.

There are in this museum two small rooms and a cabinet to which an unusual measure of interest attaches, both because of the original idea implied in their foundation and from the number of singular objects they contain. These constitute the "Psychological Museum" established by Prof. Montegazza in 1889, under the sanction of a royal decree of that date. Prof. Montegazza's intention is to illustrate, or symbolize, human passions, sentiments and so forth, with the help of objects, which serve in their expression or their gratification, or both. In view of this, human feelings have been divided into the sentiments of Religion, Cruelty, Vainty, Caricature, Property, and Sentimenti Diversi, to each of which one or more cases in the museum have been allotted.

By far the largest part of the collection, numbering some 1487 exhibits, consists of objects illustrative of the religious sentiment, with the subdivision of superstition in some of its commonest forms. One of the most curious things discovered in this department was a special form of prayer for curing babies of worms. As an illustration of the unexpected way in which a familiar and venerable superstition may be applied to thoroughly modern conditions, one notices, close by, the badge or ticket of Bed No. XIII in a hospital at Florence, which a woman refused to occupy. Less easily accounted for is the belief among Ligurian fishermen and sailors that two plain unblessed bits of string (No. 293) when tied around the ankles, are a guard against cramps. In the present writer's school days, it was generally held among the boys, on especially warrantable grounds, that two crossed horsehairs in the palm of the hand would not only prevent pain altogether, but infallibly break the cane.

Catalogues received:—

Brooklyn College of Pharmacy—Brooklyn, N. Y. Seventh annual announcement. Session of 1897—98.

Cleveland School of Pharmacy — Cleveland, O. Sixteenth annual announcement, Session of 1897—98.

College of Medicine, Syracuse University—Announcement 1897—1898.

Missouri Medical College—St. Louis, Mo. Fifty-seventh annual announcement. Session 1897—98 and catalogue of session 1896—97.

New York Medical College—N. Y. Annual announcement. Thirty-fifth session 1897—98.

Rush Medical College—Chicago, Ill. Fifty-fifth annual announcement 1897—98.

St. Louis College of Pharmacy—St. Louis, Mo. Prospectus: thirty-second annual session, 1897.

Western Pennsylvania Medical College—Pittsburgh, Pa. Announcement 1897—98.

Scientific Societies.

American Pharmaceutical Association.

The forty-fifth annual meeting of the American Pharmaceutical Association was called to order by President Joseph E. Morrison of Montreal at 3 o'clock Tuesday afternoon, August 24, at the Hotel Lafayette, Minnetonka Beach, Minnesota. The association was welcomed by Senator C. K. Davis on behalf of the state and the Twin Cities, and by Professor Wulling on behalf of the Minnesota Pharmaceutical Association, which convened at Lake Park Hotel, also on the shores of Lake Minnetonka. Professor Good of St. Louis responded for the association.

President Morrison in his address emphasized the need of better educated pharmacists, the necessity of elevating the calling along various lines and of preventing offenders of the liquor law from seeking protection under the name of pharmaceutical licentiates.

After adjournment the nominating committee met and decided to recommend the following ticket: — President: H. M. Whitney, Lawrence, Mass.; First Vice-President: G. C. Bartells, Camp Point, Ill.; Second Vice-President: W. S. Thompson, Washington, D. C.; Third Vice-President: J. A. Miller, Harrisburg, Pa.; Treasurer: S. A. D. Sheppard, Boston, Mass.; General Secretary: Chas. Caspari Jr., Baltimore, Md.; Reporter on the Progress of Pharmacy: C. Lewis Diehl, Louisville, Ky.; members of the council for a term of three years: G. F. Payne, Atlanta, Ga.; W. A. Frost, St. Paul, Minn., and Caswell A. Mayo, N. Y.

The evening was taken up by a reception and promenade concert tendered the national organization by the Minnesota Pharmaceutical Association.

The Second General Session was called after 10 o'clock Wednesday morning. The report of the nominating committee was received and the ballot of the association cast for the nominees of the committee. The reports of the committee on membership, of the Reporter on the Progress of Pharmacy, of the Secretary and Treasurer were read and received. The report of the Committee on Prizes recommended the award of the first general prize to J. M. Knox and A. B. Prescott for their valuable paper on The caffeine compound in kola; the second to S. P. Sadtler for his paper on the Destructive distillation of linseed oil; the third to W. O. Richtmann and E. Kremers for the continuation of their work on The menthol group. The Ebert prize, which has not been awarded since 1891, and which is restricted to original investigations of an applied character, was awarded to the recipients of the first general prize.

The **Commercial Section** had a short session during the afternoon. Mr. Lewis C. Hopp of Cleveland, O., read his address as chairman in which he recommended action to be taken with regard to the trade-mark problem. No papers were presented and there was little other business of a routine nature. The officers elected for the following year are: President: Joseph Jacobs, Atlanta, Ga.; Secretary: J. H. Bobbitt, Raleigh, N. C.; Associates: N. A. Rohm, Omaha, Nebr., and H. F. Hassebrock, St. Louis.

In the evening President Cyrus Northrop of the University of Minnesota addressed the audience on Modern tendencies of educational methods.

The first session of the **Scientific Section** was to have taken place Thursday morning. The Ladies' Auxiliary, however, had arranged a trolley tour of Minneapolis and St. Paul "for the visiting ladies and their escorts." A canvass had been taken the day previously and about one hundred persons expressed their intention to go. On Thursday morning, however, the fair weather and the gay departing sight seers proved too much of a temptation. Not only where the morning and afternoon sessions thus broken up, but the ladies' committee, not prepared for so large a crowd, was greatly embarrassed. Nevertheless the trip was greatly enjoyed, Lake Harriet, Minnehaha Falls, the State University, Lake Como etc. being visited. Luncheon was served at the University Gymnasium. Toward evening the party returned from St. Paul to Minnetonka Beach by train.

While most of the members were enjoying this outing the officers of the section with such others as they could bring together transacted as much as possible of the routine business. The first and second sessions being thus disposed of, the third session of the **Scientific Session** was called to order by chairman Wm. C. Alpers of New York, who proceeded to deliver his address. Papers and reports were then read and discussed:

A. B. Prescott: Alkaloidal combinations in caffeine bearing plants. This is a continuation of last year's work. (See p. 172.)

E. Kremers: Volatile oils and their assay; part of a report made at the request of the section and of the Special Committee on Research. (May appear in a later number of the Review.)

A. B. Prescott: Report as chairman of the Special Committee on Research. Eleven papers by almost as many authors were reported upon by the committee. A chemical bibliography of morphine, 1875 to 1896 was prepared by the clerk of the chairman. (This will appear later in the Review.) Edward Kremers and A. B. Lyons were elected members of this committee for two years.

Leo Eliel: Report as chairman of the Committee of Revision of the U. S. Pharmacopœia. This committee is the A. Ph. A. committee and should not be confounded with the committee elected by the decennial conference at Washington. Parts of the report of this committe were discussed at some length but no action in the way of recommendations was taken.

Joseph Feil: Practical notes.

C. S. N. Hallberg: On the solubility of pills.

Wm. C. Alpers: Aralia nudicaulis.

Owing to the lateness of the hour a number of papers presented by persons not at the meeting had to be read by title only. The Section on Education and Legislation was requested to permit the reading of a number of other scientific papers in that section if time permitted. The following officers were elected for the coming year: Chairman: E. Kremers, Madison, Wis.; Secretary: A. B. Lyons, Detroit, Mich.

The first session of the **Section on Education and Legislation** was called to order by chairman C. S. N. Hallberg, Friday morning; the first number on the program being the reading of the chairman's address. Several reports were read or made orally, the summary of answers to main questions of the committee's circular of investigations being presented by the chairman of the committee and section. Papers were then read and some of them discussed.

E. S. Dawson: Should a pharmacy law be uniform territorially.

H. M. Whitney: Should pharmacists or the state support the pharmacy law and the board.

Jos. Jacobs: Uniform pharmacy law—as to place of registration.

A. B. Prescott: On provisions of a poison law, and measures of its enforcement.

L. E. Sayre: Shall a compulsory curriculum be established in lieu of registration by diploma?

Jos. Jacobs: Practice and ownership in pharmacy.

Harry B. Mason: Concerning the questions given in state board of pharmacy examinations.

The second session of the **Section on Education and Legislation** was called to order in the afternoon. The report of the committee appointed by special resolution last year was submitted and read as a report by the chairman only and without discussion was ordered printed, copies to be sent to the various organizations. The committee on National Legislation reported through its chairman F. E. Stewart.

The section adjourned shortly before four o'clock to permit its members to take part in the steamer ride through the Upper and Lower Lake, a two hours trip that proved most enjoyable. The evening was given over to a concert under the auspices of the Ladies' Auxiliary Committee.

The third session of the **Section on Education and Legislation** was held Saturday morning. The following papers belonging to this section were read:

J. H. Beal: Note on the relation of the pharmacist to the pharmacy law.

F. E. Stewart: Should pharmacists prescribe over the counter.

H. M. Whelpley: Report on the use of the metric system in 233,000 prescriptions.

Jos. Jacobs: A distinguished physician-pharmacist.

The following papers referred to this section by the scientific section were also read:

C. Flexnor: Medicine of the Swampy Cree Indians of the north.

L. E. Sayre: Taraxacum root.

Wm. F. Alpers: Prescription filing.

Several other papers were read by title only. The section elected the following officers: Chairman: J. H. Beal, Scio, O.

The final **General Session** was called to order Saturday afternoon by President Morrison. Reports of committees were read and received, among them those of the committees on tax-free alcohol, on beneficiary features and on the meeting of 1900. The minutes of the various meetings of the council were also read and approved.

With this session the official work of the association came to an end. The evening was given to a hop, and on the following Monday those who remained enjoyed the excursion to Taylor's Falls and the Dallas of the St. Croix. For the benefit of those who intended to go to the Yellow Stone Park the social session was extended another week.

British Pharmaceutical Conference.

The thirty-fourth annual meeting was called to order by President Chas. Symes in the hall of the Grand Hotel, Glascow. After the customary greetings the President delivered his address, which on account of the jubilee year was principally of a retrospective character. The following papers were read:

John Attfield: Note on the word asafetida.

E. H. Farr & R. Wright: Further note on the pharmacy of *conium maculatum.*

Wm. Findlay: Preliminary note on the action of certain preparations and active principles of *conium maculatum.*

J. C. McWalter: Some observations in organotherapy.

J. C. Umney & R. S. Swinton: Further observations on commercial oil of citronella.

F. Dunlop: The pharmaceutical value of Sumatra benzoin.

G. G. Henderson: Notes on some soluble compounds of arsenic.

L. Atkinson: Pharmaceutical ethics — a retrospect.

R. Brodie: Note on syrupus ferri quininae et strychninae phosphatis (Easton's syrup).

C. T. Tyrer: Hypophospites.

F. C. J. Bird: Medicinal petroleum.

G. C. Druce: The salient features of the Scottish flora.

C. A. Seyler: Note on the strength of commercial samples of alkaloidal tinctures.

W. G. Stratton: Phosphates and platinum.

W. G. Stratton: Liquor bismuthi et ammonii citratis.

S. Rideal: Disinfectant soaps.

G. Sharp: Our present knowledge of the mydriatic group.

Belfast was selected as the place of meeting for next near. Dr. Charles Symes of Liverpool was reelected President; John Moss of London, Treasurer; Asst. Secretary, J. C. Nightingale; Editor of the Year-Book, Louis Siebold; also vice-presidents and other officers.

Annual Meeting of the Society of Chemical Industry.

The Society of Chemical Industry held its annual meeting at Manchester, beginning Wednesday, July 14. A large number of members were present. The report of the Council stated that the number of members on the register is now 3,026, compared with 2,971 at the last annual meeting. During the year 104 papers have appeared in the Journal. Dr. Schunck, one of the oldest Fellows of the Chemical Society, having been elected in 1842, and now retiring President of the Society, delivered a very interesting address.

The following were elected as Members of Council:— President; Prof. F. Clowes, D. Sc., Nottingham. Vice Presidents: David Howard, London; Ivan Levinstein, Manchester; A. Gordon Salomon, London; Dr. W. Jay Schieffelin, New York; Dr. Edw. Schunck, F. R. S., Manchester; Wm. Thorp, D. Sc., London. Ordinary Members of Council: Sir David Gamble, Bart, C. B., St. Helens; Prof. J. J. Hummel, Leeds; John Pattison, Newcastle; Walter F. Reid, London. Honorary Treasurer: E. Rider Cook, London. Hon. Foreign Secretary: Ludwig Mond, Northwich.

After the annual meeting the members lunched together at Owens college and in the afternoon they had a very pleasant garden party at the President's residence.

Fourth Annual Meeting of the German Electrochemical Society.*

At the fourth annual meeting of the German Electrochemical Society held at München more than 200 attended. Among those present were many men, prominent in the field of chemical and electrochemical science; Dr. Böttinger, director of the Farbenfabriken vormals Friedrich Bayer & Co., Elberfeld; Prof. Ostwald, Prof. Wagner, of Leipzig; Prof. Nernst, Göttingen; Dr. Borchers, Duisberg; Commerzienrath Holbs, Eisenach; Geheimrath v. Bayer, Prof. Hilger, München; and others. At the reception held in the "Münchener Hofbräuhaus" there were present, besides the guests from other cities, also the authorities from the University and the Technische Hochschule. The chairman of the local committee at München welcomed the guests, after which Prof. Ostwald, as chairman of the meeting, gave a toast.

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* The Review is indebted to Dr. J. A. Mjoen of Munich for this report as well as for abstracts of papers read.

First Session.

Prof. Ostwald in the chair. After a short address by Prof. Ostwald the reading and discussion of the scientific papers took place. Prof. Linde of München, opened this part of the programm by giving a lecture on an Apparatus for liquifying air and for producing very low temperatures. Prof. Ostwald next spoke on Scientific and technical education in Germany. The speaker said that Germany had attained a technical as well as scientific superiority such as no other country could show, and he believes to be able to trace this back to the better scientific training of its chemists. In England and also in France, technical education is well provided for, but, and especially in England, the young chemist is often kept away from the factories, whereas in Germany chemical science is heartily supported by the factories. Another reason the speaker thinks to find in the hard examinations given in France and also in England, which aid the student neither to independent thought nor stimulate him to original work. The higher the requirements for examination, the less time will the student have for original thought and work, and it is in this scientific work that the speaker seeks the basis for the superiority of the German chemist. Prof. Ostwald then spoke against the motion to compel the chemist to take a state examination. In the discussion which followed Dr. Böttinger spoke on the affirmative, v. Bayer and Victor Meyer on the negative. The latter said that the greatest stress ought to be laid upon independent investigation, in other words, upon the dissertation of the applicant. Dr. Böttinger's proposal to make a request to the government to institute such a final state examination was defeated by a large majority.

Calcium carbide and Melting and Distillation of Metals was then given by Joh. Pfleger of Frankfort.*

The committee on electrochemical units of measurement then made the following propositions:

1. Conductivity is to be expressed in ohm and centimeter; the unit of conductivity is therefore possessed by a liquid, which, in the form of a cube of 1 cm. edge, has the resistance of 1 ohm.

2. Molecular conductivity is the conductivity defined under 1., divided by the number of gram molecules dissolved in 1 c.c.

3. The quantity of electricity necessary to separate one gram equivalent, namely 96540 coulombs, is to be represented by F. (in remembrance of Faraday) in abbreviation.

The propositions were unanimously adopted.

Dr. Böttinger next spoke on the motion made by many of the members and generally approved by the committee, namely, "To send an expert to North America in order to study the condition of electrotechnique in that country." The speaker approved of the motion heartily and emphasized that in the first place it would be necessary to obtain the moral help of the Reichsregierung. The expense was to be paid in part by the society, the remainder by voluntary subscription. The expense can be estimated at about 4000 M. and Dr. Böttinger therefore recommended that the committee vote for the purpose 1000 M. Commerzienrath Holbs of Eisenach in speaking of his experiences in America was warmly for the motion, which after a short debate was favorably received.

The selection of a place for the next meeting was left to the committee as usual.

Proceedings received:

XII Congrès International de Médecine — Programme préliminaire. Pamphlet, pp. 71.

—— Renseignements divers. Pamphlet, pp. 15.

Florida Pharm. Ass'n: Proceedings of the tenth annual meeting held at Jacksonville, Fla.

Louisiana Pharm. Ass'n. Report of the fifteenth annual proceedings, New Orleans, La.

Manitoba Pharm. Ass'n. — Proceedings of the first annual convention held in Winnipeg, Aug. 1897.

—— Act of incorporation and by-laws. Pamphl.

Missouri Pharmaceutical Association: Proceedings 1895—96.

Pharm. Ass'n of the Province of Manitoba — Winnipeg. Announcement of lectures for 1897—98.

History.

On the Early History of Woolfat.

Prof. Th. Husemann has published in Janus, a journal edited in Amsterdam and devoted exclusively to historical and geographical medical investigation, a minute study well worth reading, upon the discovery of the healing agency, the earliest names and various modes of preparation and the uses of woolfat, the raw material of our modern lanolin. In view of the interest which this dissertation will surely awaken in pharmaceutical circles, it seems advisable to reproduce here the results of this learned investigator, as he has himself summed them up at the close of his paper.

Casting another glance at the results to which our investigations lead, writes the author, we see that the cosmetic and medical application of a product derived from the oily, unscoured wool of sheep was quite general at the time of Cæsar Augustus (Ovid, Celsus) and its use was so widespread that it formed quite an important article of trade. The statements about the much earlier (450—400 B. C.) existence and medical use of this product among the Greeks are uncertain, as the passages in the Greek writers (Herodotus, Hippokrates, Aristophanes) supposed to mention it, refer to unscoured wool (*ἔρια οἰσυπηρά*), but not to woolfat, besides which latter the wool containing it was much used in later years (Galen, Aretaeus, Alexander of Tralles and others).

The medicinal use of this product was not founded upon the idea, which must be considered as the inventing thought in the preparation of lanolin (which is analogous to the product of the ancients) by Liebreich, viz: the idea of deriving a material for the preparation of white salves, by emulsion of purified woolfat with water. The fact that the product derived by the various methods described by Dioskorides and Pliny for the extraction of woolfat would become white by emulsion with water, was known to the ancients, but was used only to establish its identity, but not for pharmacotactical purposes. The directions for the production of the various woolfat preparations, which I have mentioned, from the time of Celsus to the second decade of the 19th Century show, that the water, which possibly was present in the product, was entirely irrelevant, and that also not only in the most commonly used plasters and cerates (Ennea pharmacon, Tetrapharmacon, Ceratum oesypatum Galleni and Philagrii, Diachylon magnum, etc.), but also in the softer forms, especially the Pessi, much used in gynaecological practice (Soranus, Muscio, Paulus of Aegina and others) and the embrocations of the ancients in cases of muscular exertion (Damokrates, Galen and others). It was not the recognition of the applicability of perfectly purified and neutralized woolfat (which was unknown to the ancients) in the preparation of salves, but the belief that the fat of sheeps wool had peculiar healing properties in certain cases of sickness, which determined its medicinal use in ancient times.

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* See p. 182.

These indications of the medicinal application are based chiefly not on the observation of the action of woolfat applied alone, but on the action of medicines in which it was used. The healing action observed in the application of the so-called Acopa, in which it was used, is surely not a specific effect of woolfat, but is attributable to the friction and massage caused in the application of the Acapon. In the action on the uterus, the woolfat of Pessus is of less importance than Pessarium, with which it was introduced. The peculiar influence upon conception attributed to woolfat in the middle ages and the effects in cases of syphilis, supposed to have been observed in the 16th Century, must be accounted for by the easy faith of the physicians of those times.

The woolfat, which was an article of trade at the time of the first Cæsars, especially the choicest of Attika, although according to the directions for preparation it can have been neither white nor neutral, and seldom free from impurities, was undoubtedly far better than the preparations that appeared in the drug shops in the middle ages and in the 16th, 17th and 18th Centuries, which toward the end of the 16th Century was described as stinking.

This deterioration must be considered the principal cause of the disappearance of woolfat from the store of medicines. Mesuë jun. attempted to take the preparation out of the hands of the shepherds and give it to the apothecaries, by prescribing a mode of preparation much different and simpler than the old, yet he did not succeed in producing a suitable preparation. The reintroduction of Dioskorides' directions for preparations by the pharmacopœias of the 16th Century caused the apothecaries great trouble and annoyance, and ultimately led to the protest of Zwelfer in the Pharmacopœa Augustana Reformata against the retention of this remedy in the medical books. Nevertheless the product, prepared essentially after the direction of Mesuë, was retained longer than is generally supposed (being found in the Spanish Pharmacopœa of 1817). In France the Codex medicamentarius of 1758 mentions woolfat as l'œsipi among the Simplicia.

If a classical term is desired for the woolfat product, which is to be considered the precursor of lanolin, the Latin form Oesypum is preferable. The form Oesypus was derived from the Greek ὄισυπος by the physicians of the 16th Century. The form Hyssopus, as the article was usually called in the officinals, and to which was added "humidus" in order to distinguish the woolfat from the herb Isop, which was termed "siccus," is not a barbaro-latin form, as is usually said; on the contrary it can be traced to Pliny and was used by various Greek and Roman authors. The form was not originated by the Arabians, but was transferred from the Greek to the Arabian authors.

Bibliography.

Der elektrische Ofen, the authorized German edition of Moissan's recent work, by Dr. Theodor Zettel, has been published by M. Krayn of Berlin W.

The August number of the American Journal of Pharmacy contains a biography of the late Professor Edson S. Bastin, from the pen of his colleague Prof. H. Trimble.

The use of the Thyroid gland in medicine, a subject that is of special interest at present, is described in the August number of Appleton's Popular Science Monthly by Dr. P. Bailey.

Paul Dupont of Paris announces as about to appear a Nouvelle Flore de Lichens pour la détermination facile des espèces sans microscope et sans réactifs, avec 1178 figures inédites, by A. Bristol, Professor at the University of Paris.

Die Natur contains a series of papers on animal pharmacognosy by Prof. O. Taschenberg, the editor of the journal; another on the derivation of common botanical names. Both papers are very interesting and merit attention on part of pharmacists.

Appleton's Popular Science Monthly for this month contains two papers of special interest to pharmacists: Alchemy redivivus, by A. E. Outerbridge; and Fourteenth-century doctors, by M. E. Nicaise, translated from the Revue Scientifique.

The Beiträge zur wissenschaftlichen Botanik, edited by Prof. M. Fuenfstueck, the first volume of which had been published by Erwin Naegele of Stuttgart, will hereafter be published by A. Zimmer's Verlag of the same city. Part one of vol. II has just been issued and contains four contributions with five plates.

H. Lamertin of Brussels announces as soon to appear a work entitled Les théories physicochimiques by A. Reychler, Professor at the University of Brussels. The same firm announces Documents sur la composition normal des principales deurées alimentaires and boissons usitées en Belgique. This work is written by a large number of specialists.

In connection with their exhibit at the Sächsich-Thüringische Industrie- u. Gewerbe-Ausstellung taking place at Leipzig at the present time, the firm of Schimmel & Co. have issued a descriptive catalogue which, like all their publications, is of more than common interest and possesses a permanent value. The brief description of the history of the factory and its scientific accomplishments is exceedingly instructive, showing how much the best practical results rest on a thorough scientific foundation. The catalogue of oils, their source, physical constants and chemical composition is not unfamiliar to those who receive the semi-annual reports. The catalogue of chemical preparations, however, appears to be new and is as interesting as it is instructive.

Catalogues received:—

J-B. Baillière et Fils—Paris. Bibliographie botanique, Fascicule I. A—C.

Chemical Publ. Co.—Easton, Pa. Recent books on chemistry and allied subjects.

Jaques Leshevalier—Paris. Catalogue trimestriel de livres anciens et modernes. Botanique.

Commercial.

Pricelists received:—

Parke, Davis Co.—Detroit, Mich. Price list 1897, pp. 204.

Roessler & Hasslacher Chem. Co.—New York. Price list, Aug. 1897.

Tyler & Finch—New York. Price list.

Zimmer & Co.—Frankfurt a. M. Vorzugs-Preise Ende Juli 1897.

—— Beilage zu unserer Vorzugsliste Ende Juli 1897.

Pamphlets received:—

Böhringer & Söhne—New York. Clinical notes on lactophenin. By Dr. A. H. Roler. Reprint from the Chic. Med. Rec.

—— Clinical observations on lactophenin. By Dr. Geo. Thompson. Reprint from Tri-State Med. Journ.

Greiner & Friedrichs—Stuetzerbach i. Thuer. Quecksilber-Luftpumpe mit selbstthätigem Betrieb.

Heinrich Haensel—Pirna a. d. Elbe. Bericht über das zweite Vierteljahr 1897.

—— Extract from the quarterly report on essential oils and fruit essences, July 1897.

Lehn & Fink—New York. Antitoxins, Pamphlet, pp. 40. Illustrated.

—— The therapeutic value and administration of iron. By Dr. R. C. Kenner. Reprint from Notes on New Remedies.

Pabst Brewing Co.—Milwaukee, Wis. A plan to stop cut prices as devised by the retail druggists of the United States. Pamphlet, pp. 21.

Schering & Glatz—New York. Ueber eine neue Methode zur Desinfection von grösseren Räumen mittelst Formalin. Von Dr. Hans Aronson. Separat-Abdruck a. d. Zeitsch. f. Hygiene und Infectionskrankheiten.

—— Eucaine hydrochlorate. May, 1897. Pamphlet, pp. 80.

—— The silver treatment of wounds. By Dr. Credé. Pamphlet, pp. 8.

Schimmel & Co.—Leipzig. Descriptive catalogue of exhibit at the Saechs.-Thuer. Industrie- u. Gewerbe-Ausstellung, Leipzig, 1897.

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SUPPLEMENT, SEPTEMBER 1897.

Scientific Organizations.

Pharmaceutical Scholarships in England.

The Pharmaceutical Society of Great Britain offers annually three educational and two or three research scholarships — viz., two Bell scholarships, value 30 l. for one year and free education in the School of Pharmacy, and one Manchester Association scholarship, value 26 l. without free education. The research scholarships are the Redwood and S. M. Burroughs Memorial, each of the value of 30 l., awarded to pharmaceutical chemists only by the Pharmaceutical Council, and the Salters's fellowship, value 100 l. a year for three years. These are tenable in the Society's laboratories. The Burroughs scholarship is awarded biennially.

The Hanbury and Flueckiger Medals.

The two pharmaceutical medals prized by pharmaceutical scientists throughout the civilized world are of comparatively recent date. It is as unique as it is significant that both should have been established in honor of two men whose life was given largely to the study of vegetable drugs, men who worked together in the same field not as rivals, but as intimate friends. These two men, one an Englishman, the other a German Swiss, have erected a joint monument unto themselves in the classical history of drugs, the Pharmacographia. Their friends have honored them in the establishment of medals known by their respective names.

Flueckiger Medal.

The Hanbury Memorial was established in 1879, four years after his death. The gold medal is issued every two or more years for special achievements in the realm of pharmacognosy. The medallist is elected by the presidents of the Chemical Society, the Linnean Society and the two pharmaceutical societies of Great Britain. It is presented by the council of the Pharmaceutical Society of Great Britain. The first medal was bestowed upon Hanbury's associate and friend, Professor Flueckiger, then of Strassburg, in 1881. In 1883 it was awarded to John E. Howard; in 1885 to Georg Dragendorff; in 1887 to Wm. Dymock; in 1889 to G. Planchon; in 1891 to O. Hesse; in 1893 to J. M. Maisch; in 1895 to A. Vogl; and this year to Dr. J. E. De Vrij, the quinologist, of the Hague, Holland (see p. 31).

The Flueckiger Testimonial and Memorial was established in 1892, at the time of Professor Flueckiger's retirement from active duties at the University of Strassburg. Most of the money raised at that time was used for the endowment of a Flueckiger scholarship, or for providing grants in the aid of research. The remainder served to defray the cost of an illumined address, an album containing the portraits of subscribers, and a gold medal with replicas in bronze. Such replicas were sent by Professor Flueckiger to the presidents of the German and Swiss apothecaries' societies and of the Pharmaceutical Society of Great Britain; also to John Attfield, A. Beckurts, G. Dragendorff, J. T. Fritzsche, P. Giacosa, Thos. Hanbury, A. Hilger, Fr. Hoffmann, Th. Husemann, Th. Peckolt, G. Planchon, Ed. Schaer, E. R. Squibb, A. Tschirch. In 1894 it was also given Prof. A. Vogl of Vienna, at the time the Verein deutscher Naturforscher und Aerzte held its sixty-sixth annual session in the old Kaiserstadt.

At Flueckiger's death, however, the testimonial fund assumed the nature of a memorial fund. Amongst other important changes, it was decided to strike no more complimentary replicas of the presentative medal, but to award the gold memorial medal every five years, for distinguished services in the promotion of scientific pharmacy, the first medal to be awarded in 1897. The medal is awarded alternately by the German and Swiss apothecaries' societies. At the Strassburg meeting the German Apothecaries' Society, upon recommendation of its council, voted to award the first medal, i. e. since Professor Flueckiger's death, to Mr. E. M. Holmes, Curator of the British Pharmaceutical Societies' Museum. Inasmuch as a German was the first recipient of the Hanbury medal, it seems but courteous—disregarding other considerations for the moment—that the first Flueckiger medal should go to England.

Botanical Society of America.

The new officers are as follows: N. S. Britton, New York, president; J. C. Arthur, vice president; C. R. Barnes, Madison, Wis., secretary; Arthur Hollick, treasurer.

Pharmaceutical Fellowships in Wisconsin and Michigan.

Although the American Pharmaceutical Association and the older colleges of pharmacy have done little or nothing to stimulate graduate work, the university schools of Michigan and Wisconsin have been fortunate in securing assistance for this purpose. In 1894-5 some Wisconsin druggists provided for a fellowship which was continued during the following year. During the academic years of 1895-6 and 1896-7 two fellowships were maintained at the University of Wisconsin by Mr

August Uihlein and Mr. Fred Pabst, both of Milwaukee. The University of Michigan was favored during the same period of two years by a fellowship from Mr. Frederick Stearns of Detroit. According to reports the fellowships of Mr. Uihlein and Mr. Stearns are to be continued during the coming year.

Catalogues received:—

Scio College—Scio, O. Annual announcement of the Department of Pharmacy. 1897—1898.

Professional.

Although there may be but poor comfort in the verification of the adage that "misery loves company" it may do no harm to show that other callings suffer from reasons similar to those that have brought about the present condition in pharmacy. An evil must first be correctly diagnosed before the remedy can be applied. For this reason the two subjoined statistical notices with reference to physicians in England and lawyers in the United States may prove something more than merely interesting.

The Increase of British Physicians.*

The overcrowded state of the medical profession in Great Britain has recently been the subject of discussion in the London press, and particularly in the columns of the Standard. Medical men are not so well off now as they were thirty or forty years ago. Among the causes of this state of things are, it is urged: (1) Increased competition; (2) the enormous growth of the out-patient departments of hospitals, and the increase in the number of special hospitals; (3) the great increase in the sale of patent medicines; (4) the liberty allowed to quacks and other unqualified practitioners; and (5) the extensive prescribing by chemists and druggists. The increase in the number of practitioners has been relatively greater than the increase in the population. In 1878 there was one medical practitioner to every 1,645 persons in England and Wales; now there is one practitioner to every 1,451 only. The facilities for education among the less well-to-do classes have, no doubt, had their share in adding to the numbers who have swollen the ranks of the medical profession. The number of hospitals and dispensaries in England and Wales was 755, with a medical staff of 3,377, in 1878; in 1893, the hospitals and dispensaries numbered 928, and the medical staff 4,454.

The American Lawyer Crop.†

There are now, according to the Legal Adviser, in this "model republic" not less than 90,000 professional lawyers, or one lawyer to every 800 of the population. In the greater cities, the ratio of lawyers to other folk is still greater. In Chicago, for example, a recently compiled directory of lawyers shows that nearly five thousand lawyers are struggling for existence, or one lawyer to every 350 inhabitants. In half a dozen other American cities the ratio of lawyers to laymen is about the same. In other civilized countries the proportion of lawyers to possible clients is much smaller. France, with a population of forty millions, has only 6,000 lawyers—1,000 more than Chicago—a ratio of 1 to less than 5,000. Germany, with more than 45,000,000 population, has but 7,000 lawyers—1 to about 6,500. In Great Britain the proportion of lawyers to other folk is about the same.

Statistics show an amazing increase of annual "crop" of American lawyers in the last fourth of the century. In 1870, the law schools reported 1,611 students; in 1885, 3,054 students; in 1891, 6,106 students; in 1894, over 7,600 students. Last year the reported number of law schools had swollen to 85, and of law students to more than 10,000. This rapid increase of the supply of lawyers certainly has not been the consequence of an increasing demand. Instead of increasing in the ratio of the increase of lawyers, the business and emoluments of the legal profession have diminished. Mr. Edwards deems it "safe to say that, approximately, fifty per cent of the ordinary revenues of the old time law office have been cut off in recent years. Since banking institutions have engaged in the semi-professional occupation of collecting claims and rents, and loaning money, and taking securities, and since the business of conveyancing, which at one time was inseparable from a law office, is now no longer the necessary adjunct which it was, lawyers have found their income very greatly reduced." Moreover, the functions of the lawyer, obeying the inevitable law of evolution, have steadily tended to specialization and concentration. In Chicago and its environs, for example, the bulk of legal business is transacted by hardly more than one hundred law offices, leaving more than four thousand lawyers to skirmish and forage for a precarious existence as they can. It is the same in other populous centers.

One of the fields into which this skirmishing for existence is carried by briefless lawyers is the production of more lawyers. The grand army of the legal skirmishers is annually increased by increase of the number of law schools—establishments not founded to make lawyers so much as to extract from deluded young men who bamboozle themselves with the ambition to become lawyers the means of subsistence for superfluous lawyers already made, or half made. The principle on which a prodigious number of these prolific law schools are based seems to be much the same as that of our political system, namely, that the less a man knows of the science and art of administration, the better is he qualified for the administrative service of government. The consequence is a steadily increasing annual deluge of underdone lawyers cast upon the barren shore of a congested profession to struggle for existence in "ways that are dark and tricks that" are the reverse of elevating to American manhood.

Bibliography.

Number six of the Berichte d. d. pharmaceutischen Gesellschaft contains a biographical sketch of the late Dr. Hermann Hager by M. Holz; and another of the late Dr. P. C. Plugge by Ed. Schaer.

The following bibliographic notice is taken from a recent number of the Nation: A new Boston firm, of the class which is exercising a wholesome influence on taste in book manufacture, Richard G. Badger & Co., announces 'The right side of the car', a story by John Uri Lloyd, author of 'Etidorhpa'.

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* From The Nation.

† From the Scientific American.

The Division of Botany of the Department of Agriculture has published a bulletin (No. 10) calling attention to three new cruciferous weeds which have been reported from several new localities in the northern United States and Canada during the past four years, in some places having already become aggressive weeds. They are *Berteroa incana* (L.) DC., *Conringia orientalis* (L.) Andrz., and *Neslia paniculata* (L.) Desf.

John Wiley & Sons of New York announced their intention to issue before Oct. 1st, a greatly improved and enlarged edition of Fresenius' Qualitative Chemical Analysis. The translation by Prof. H. S. Wells of the Sheffield Scientific School of Yale University is based upon the recent 16th German edition. Other books in the press by the same firm are A handbook for chemists of beet sugar houses and seed culture farms, by G. L. Spencer of the U. S. Dept. of Agriculture; and Quantitative chemical analysis by electrolysis, translated by Prof. W. H. Herrick from the third German edition of Prof. Alexander Classen.

The third edition of Rudolf Benedikt's Analyse der Fett und Wachsarten edited by Prof. Ferdinand Ulzer of the Technologisches Gewerbe-Museum of Vienna has just been issued by Julius Springer of Berlin. The same author jointly with Dr. A. Fraenkel has also written an Anleitung zur chemisch-technischen Analyse. Die Untersuchung der Schmiermittel und verwandter Produkte der Fett- und Naphta-Industrie, by Dr. D. Holde; and Anleitung zur quantitativen Bestimmung der organischen Atomgruppen, by Dr. Hans Meyer have also appeared recently by the same publisher.

A new illustrated monthly journal of popular botany to be called the Plant World, occupying a position intermediate between the technical botanical periodicals and the smaller amateur publications will begin its issue on Oct. 1, 1897. It will aim to present the facts of plantlife in simple, popular language and endeavor to interest those who desire acquaintance with plants and their life histories but who have no inclination for a systematic course of study. In form, it will be a 16-page octavo. The editorial staff is as follows: Editor in chief, F. H. Knowlton Ph. D., U. S. National Museum, Washington, D. C.; Associates, Mr. C. L. Pollard, Miss Clara Cummings, Mr. Walter Hough, Mrs. N. L. Britton, Miss Josephine E. Tilden and Mr. A. W. Evans. The price will be $1.00 per year. Publishers, Millard N. Clute & Co., Binghampton, N. Y.

Catalogues received:—

John Wiley & Sons — New York. Some recent publications.

Commercial.

Vegetable Drugs.

The following extract from the Report of Caesar & Loretz contains several items of more than ephemeral interest and, therefore, merits translation.

In the last ten years there has been a marked improvement in the quality and intrinsic value of vegetable drugs offered to the trade. Much of this is due to the fact that this branch has been specialized, thus leading the dealer involuntarily to a deeper knowledge of the peculiarities and special properties of the vegetable drugs. In order to give them and retain for them the standing they should have as medicines and be able to command the full recognition of the physician it is necessary that an assay of the essential constituents be given for all the more important drugs to be used in medical prescriptions. It is therefore very fortunate that a very decided interest has been displayed among scientists in the preparation of these essential or active constituents, and so it is probable that in the near future a standard of value will be fixed by statute for all the more important drugs. While these drugs will thereby become an unvarying element when applied in medical practice and not dependent on all sorts of conditions, the scientific investigation of them is to be highly valued also for the reason that the investigation has for its object only the general advancement, thus forming a commendable contrast to the scientific craze, prompted by selfish motives, for the invention of "heal-all" remedies. Notably during the last five years, a goodly number of very valuable scientific contributions have been produced in the field, and it is due to them that we are in a position today, to offer to the trade a number of important drugs, with the result of the assay of their active ingredients to which their medical effect is due. Cinchona, digitalis, opium, ipecac, cola, ergot, strophanthus, may be mentioned in this connection. These are results that would have been received with an incredulous smile 10 years ago and which today are not universally appreciated as they should be. The apathy which is manifested even in practical pharmaceutical circles toward the new results of the investigation of drugs, is of special significance to pharmacy inasmuch as it shows to what extent the flood of modern chemical remedies has crowded the interest in the pharmacognostic side of the profession to the rear. But the very revival of interest in this field and a better appreciation of the properties of the drug materials will again bring about the production of vegetable galenical preparations in pharmacy, and will restore to it, in the best interest of medicine, the indepence which it had lost in relation to many branches of industry which formerly stood beneath it. The extraordinarily rapid development during the last decades, particularly in Germany, in all the manufacturing branches that specialize for the druggist trade, is the best evidence of the change in the relation of pharmacy, and it would be stemming the tide uselessly, not to see a real progress in the cheapening and perfecting of the production of chemicals, etherial oils, etc., in factories, particulary since by virtue of this specialization the methods of testing have undergone constant improvements, whereby the pharmacist has been enabled to gain accurate control over the products offered. On the other hand it is all the more desirable, that the manufacture of simple galenical preparations, especially tinctures, extracts, etc., which can be made with the existing laboratory facilities, be reserved for the pharmacy, because the estimation of their value depends entirely upon the selection of the drug material which can be controlled, while a reliable test of the preparations themselves is possible to a limited extent only.

With the increase of the demand for the pulverized forms of drugs ready for immediate use, it has become a necessity that the apothecary be able to accurately test the drugs in their finest possible form. In recent years a great deal of attention has been given in scientific circles to these tests, and the microscope and chemical tests have furnished reliable points. It is only desirable, that increased interest be shown in this direction in pharmaceutical circles, and we are always ready to assist all those interested, with the experience we have gained from practice and with any material that may be needed.

The vegetable drugs that come into consideration mainly as popular remedies, have had an enormous increase in consumption in the last 5 years owing to the general expansion of the Kneipp cures and other natural healing methods. The Kneipp remedies specially have taken an annually increasing circuit around the globe, and the success furnishes the best evidence of how a medical nihilism carried too far, leads the people's desires for medicines into wholly opposite directions.

The result thus far of the year's vegetable harvest can not be called favorable, but on the contrary has turned more disastrous for some articles than was first supposed. The cold, damp weather in spring greatly interfered with the gathering and drying of the first articles, and later the excessive heat that immediately followed, and lasted for weeks, shortened the time for the gathering of some articles that developed too rapidly. The cultivated herbs suffered considerably from drought, and the abundant rain which came in July brought relief only partially. Discouraged by the unfavorable weather, and the small return resulting from the prevailing low prices for many wild growing herbs, the number of gatherers has decreased, particularly in Germany, so that it will need a marking up of the prices of some of the articles of little value, in order to increase the number of those engaged in this toilsome industry. In Russia, Austria and other countries growing drugs the harvest outcome is better than in Germany, so that in most articles a normal supply was obtained.

Reports and other pamphlets received:—

Boehringer & Soehne—New York. Ferratin, the ferruginous element of food. Pamphlet, pp. 22.

—— Ferratin, the natural iron compound of all food. Pamphlet, pp. 16.

Caesar & Loretz—Halle a. S. Geschäfts-Bericht, Sept. 1897.

Fries Bros.—New York. Trillat system of disinfection by the vapors of formochlorol. Pamphlet, pp. 19.

G. & R. Fritz—Vienna. Ueber Naftalan. Von Dr. C. Pezzoli. Leaflet, pp. 3.

Stallman & Fulton — New York. The newer preparations of bismuth. By Dr. R. W. Wilcox. Leaflet, pp. 4.

Price lists received:—

Caesar & Loretz—Halle a. S. Preis-Verzeichniss: Vegetabilische Drogen. Sept. 1897.

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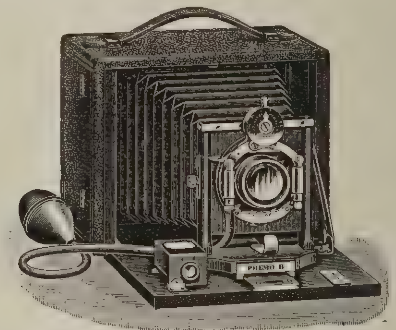

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SUPPLEMENT, NOVEMBER 1897.

Professional.

Morphinism and the Medical Profession.

The following statistical data which the Phrm. Post obtained from the Allgem. Wr. med. Ztg. seem to indicate that the morphine habit has its largest percentage of victims among physicians. Of thousand addicted to the habit the most were men and of these, physicians 287 or 40.4 p. c.; apothecaries and medical students each 21 or 3.2 p. c.; soldiers 46 or 7 p. c.; without definite vocation 100 or 14.5 p. c.; professors 3 or 0.4 p. c.; jurists 4 or 0.6 p. c.; artists 6 or 0.9 p. c.; literary men 5 or 0.7 p. c.; lawyers 7 or 1 p. c.; clergymen 2 or 0.3 p. c.; laborers 37 or 5.6 p. c. Of the women 35 or 10 p. c. were the wives of physicians; 151 or 43 p. c. without special vocation; 47 or 13.4 laborers; 50 prostitutes etc.

* A distinguished physician was heard to say that "doctors die of four things: starvation, whisky, opium and pneumonia." This was before the days of cocaine, or that drug might have been included in the list of dangers to which the active physician is exposed. We do not know how far statistics will bear out the general impression as to the abuse of alcohol and opium by physicians, and believe they would show it to be erroneous; but at present we are concerned more with the formation of such habits, and in especial the morphin habit, by patients first directed to the drug by their medical advisers.

It is well known that morphin users are not given to veracity, and one cannot therefore base an accusation upon their unsupported statements. Nevertheless we were recently much impressed by an expression used by a young woman, the victim of morphin, the drug having been first administered to her by her medical attendant for the relief of dysmenorrhea. He had given her paregoric, then morphin by mouth, then morphin subcutaneously; all, of course with due caution and only when in his judgment needed. The patient, as is so often the case, got to thinking she needed it when she did not. She called at her physician's office one day, professing to be in great pain, and asked him to give her an injection. His suspicion being arrousd he declined to do so, and gave her a placebo. She returned the next day for the injection, but the physician being out of town, she called on a neighbor, an oculist, who referred her to another neighbor, a clinician. The latter, suspecting the story she told to be untrue, told her to go home and continue taking her medicine, and to send for him should anything further be needed in her attendant's absence. He heard nothing further of the patient until some two months later, when, in response to a call from an unfamiliar name and address, he visited his new patient, to find the young woman to whom he had declined to give morphine at his office. The attendant was again out of town, and had left word that he should be summoned. The girl frankly confessed that she had contracted the opium habit in defiance of her physician's advice, and stated that she had made arrangements to enter an institution for treatment; meanwhile, she needed advice as to a recent "cold." She said: "Doctor, I give the morphine to myself now; I've bought a syringe, I know how to use it. When I called on you I was afraid to give myself the injection and I tried to fool you. I went right to another doctor, and got it. And that's the way I got it all along, when Dr. X refused to give it to me. I just went to any doctor's office I was passing. You and two others are the only ones that refused. With most of them, *"it's as easy as getting soda water in a drug store."*

We do not vouch for the truth of the girl's statement. As before remarked, morphine-users are not scrupulous as to exactitude in their stories. We fear that, in some cases at least, physicians fail to use the care that they should in giving morphine to strangers, on the mere profession of pain. In how far, moreover, physicians are responsible for the growing habit formed by patients, to whom they give injections for pain, for loss of sleep, for asthmatic attacks, or other apparently good reason is a grave problem. Certain it is that, in many cases, the bold use of morphine gives relief and brings about recovery as nothing else can, and no bad habit results. Certain it is, that in other cases, one dose necessitates a second, this a third, and so on.

Whenever the drug is prescribed, the possibility of inducing a habit should be kept in mind, and its repetition be jealously watched. If due caution be thus observed, and the drug never given unless nothing else will serve the purpose, the physician need not feel responsible for untoward consequences; but, inthe absence of such caution, the blame will lie at his door.

History.

Discovery of Anæsthesia.

The old controversy regarding the first discoverer of anæsthesia is revived by Hugh H. Young, A. M., M. D., in a paper read before the Johns Hopkins Hospital Historical Society. This paper presents the claims of Dr. Crawford W. Long. The discovery has also been accredited to Chas. T. Jackson, of Massachusetts; Wm. T. G. Morton, of Massachusetts; and Horace Wells of of Connecticut.

In 1841 Dr. Long established himself as a physician and pharmacist at Jefferson, a small country town in Jackson Co., Georgia. At this time it was fashionable to inhale laughing gas for its exhilerating effects. Dr. Long substituted ether for the nitrous oxide, and young men frequented his office for the purpose of becoming intoxicated by the inhalation. On March 30, 1842, he removed a tumor from the neck of one of these young men while the patient was under the influence of ether. During the next few years he used ether in some other small operations, but not in all that he performed. The dates at which the other claimants of the discovery first produced anæsthesia for the purpose of rendering a patient insensible to an operation are given as 1844 for Wells, and 1846 for Jackson and Morton.

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* Editorial from The Philadelphia Polyclinic.

From the evidence given there seems no doubt that Long was the first to use ether in a surgical operation. He did not print anything on his discovery until 1849, and there is no evidence that his example induced any other physician to use an anæsthetic, or even to investigate the subject. The claims of Dr. Long have been recognized by the Georgia State Medical Association and the American Association of Eclectic Physicians.

Dr. Young's paper recounts some interesting facts with relation to the patent granted to Morton, and the attempt to secure from congress a reward for the discoverer.

Dr. Long's claims are presented in briefer form in a paper read by Mr. Joseph Jacobs at the Minnetonka meeting of the American Pharmaceutical Association. Mr. Jacobs at that time did not cite all of the sourses from which he derived his information. Since then he has kindly supplied the Review with the bibliography on the subject consulted by him. It is herewith reproduced for the benefit of those specially interested in the subject:

Southern Medical and Surgical Journal. Augusta, Ga., Dec. 1859. Dr. Long's own account.

The Discovery of Modern Anæsthesia. 1894. N. Y. Publisher not given. Dr. Laird W. Nevins, Specialist, etc.

A Contribution to the History of the Discovery of Surgical Anæsthesia. Luther B. Grandy, Atlanta, Ga. Va. Med. Monthly, Oct. 1893. Also N. Y. Med. Journal, July 1895.

The Discovery of Anæsthesia. J. Marion Sims. Va. Med. Monthly, May 1877.

Contribution by H. H. Carleton, Ga. Med. Asso. Transactions 1886.

Discussions in Congress. Congress Globe, 1854.

Geo. Foy, F. L. C. S. Dublin. Surgeon to Whitmore Hospital, etc., etc., Nov. 1896. London Med. Press and Circular.

Bibliography.

A glimpse into the study of pharmacognosy is the title of an interesting article by Prof. J. O. Schlotterbeck of Michigan in the second number of The Pharmacologist.

Wandtafeln für Warenkunde und Mikroskopie by Dr. Carl Harsack, Professor at the Handels-Akademie of Vienna, are published by A. Pichler's Witwe & Sohn of Vienna. Eight charts have been published thus far.

B. G. Teubner of Leipzig has published the previously annnounced work of H. Januschke: Das Prinzip der Erhaltung der Energie und seine Anwendung in der Naturlehre, an 8vo volume of 456 pages.

Coffee and India-rubber Culture in Mexico with historical and geographical notes on the country, by Matias Romero, Mexican Minister to the United States, is included in G. P. Putnam's Sons' autumn list.

The October number which concludes the 51st volume of Appleton's Popular Science Monthly, contains an illustrated article on Science at the University of Chicago by Prof. F. Starr, and one on Early Chemical Societies by Prof. H. Carrington Bolton.

The Verlag von Wilhelm Engelmann has in the course of publication the following botanical works: Synopsis der mitteleuropäischen Flora by Dr. Paul Ascherson, of which four Lieferungen have thus far appeared; also Plantae europæae, edited by Dr. M. Guerke, of which the first part appeared in 1890. The whole is to comprise four volumes.

A new edition of the Naturalists' Directory published by S. E. Cassino of Boston is now in the course of preparation. Persons who desire to make exchanges with other naturalists should send in their names and addresses at once. The Directory is American, not international, and persons who desire to enter upon exchange relations with others will find it very useful.

The second "Lieferung" of the second part of the Physikalisch-chemische Propaedeutik unter besonderer Berücksichtigung der medicinischen Wissenschaften, the first part of which was so favorably reviewed in this journal (p. 18) is to appear at the close of this year: the third or last "Lieferung" of the second part early in 1898. This work, which is of great value to all scientists and written so that it can easily be comprehended by the intelligent laity, is published by Wilhelm Engelmann in Leipzig.

According to the Zeitschrift für Bücherfreunde the National Library at Paris contains three million volumes, the Library of the Arsenal 20,000 volumes and 8000 manuscripts, the Library Ste. Geneviève 175,000 volumes and 3000 manuscripts, the Mazarin Library 105,000 vols. and 6000 manuscripts, the Library of the Institute 120,000 vols., the Sorbonne Library 125,000 vols. and 900 manuscripts, the City Library 50,000 vols. and 30,000 cuts. This enumeration does not include the innumerable lesser libraries. So much is certain that Paris is still the "bücherreichste" city in the world.

The publishing house of Urban & Schwarzenberg of Vienna has just published Fortschritte der Hydrotherapie, edited by Drs. Strasser and Burbaum with the aid of numerous colaborers including several Americans. It is a "Festschrift" in honor of Prof. W. Winternitz who took his doctor's degree forty years ago. The same firm has just begun the publication of a Lehrbuch der allgem. Therapie und der therapeutischen Methodik by Professor Eulenberg of Berlin and Samuel of Königsberg, also with the assistance of numerous colaborers. It is to be a large octavo three volume work and will be published in parts.

During the year 1896 and the first half of the present year there appeared in the American Journal of Pharmacy a series of papers on North American conifers by Professors Bastin and Trimble, the former having charge of the botanical, the latter of the chemical side of the work. Before the work was half accomplished, however, a serious check was experienced in the declining health of Professor Bastin and with his untimely death the work had to cease altogether. The reprints have been collected in the form of a very neat brochure, which will be very welcome to those who are especially interested either in the botany or the chemistry of this interesting group.

The Committee on Indexing Chemical Literature has presented its fifteenth annual report, which states that a bibliography of the metals of the platinum group, 1748—1896, by Prof. James Lewis Howe, and a review and bibliography of metallic carbides, by Mr. J. A. Mathews, are ready for publication. A bibliography of basic slags has also been completed by Mr. Karl T. McElroy. The second edition of Dr. H. Carrington Bolton's catalogue of scientific and technical periodicals, 1665—1895, which contains 8,603 titles, will shortly be published, and a supplement to the select bibliography of chemistry, by Dr. Bolton, has been completed. The latter contains about 9000 titles, including those of many chemical dissertations, and is brought down to the end of the year 1896. Progress is also being made with indexes to the literature of thorium and tantalum, a bibliography of oxygen, and a bibliography of the constitution of morphine and related alkaloids. (See p. 226.)

The Verzeichniss sämmtlicher Präparate, Drogen und Mineralien mit Erläuterungen constitutes No. 152 of the series of publications of the well known firm E. Merck of Darmstadt. Like the bulletins and annual reports from the same source, this publication is a creditable piece of work. In many respects it resembles the Merck's Index published by the New York house—on the back it is labeled Merck's Index 1897—but does not contain the price-list feature. On the whole it has much less of the features of an advertisement and more those of a scientific compilation. The major portion of the volume is occupied by a descriptive list of pharmaceutical preparations: chemical, galenical, organo-, and bacteriological, with a brief statement of their therapeutic application and doses. Inasmuch as this list includes most of the new remedies the book will be found valuable for reference by the practitioners of both the medical and pharmaceutical professions. This list of 200 pages is followed by one of 60 pages containing in alphabetical arrangement the vegetable drugs with brief information as to their origin, common names, occurence, constituents and uses. A shorter list of chemically important minerals follows next. Lists of reagents, of standard volumetric solutions, indicators, test papers, of collections for schools and colleges, etc. together with an appendix conclude the volume.

Catalogues and announcements received:—

American Book Co.—New York. Catalogue of new books issued since 1890.

Laemmert & Co.—Rio de Janeiro. Catalogo das obras de fundo. 1897, pp. 122.

Lemcke & Buechner—New York. Monthly Bulletin 1897, Nos. 5 to 8.

B. G. Teubner—Leipzig. Mittheilungen. 30. Jahrgang. No. 4.

U. S. Dept. of Agriculture—Washington. Monthly list of publications. Aug. 1897.

Commercial.

Licorice from Asia Minor.

The project of constructing a railway from the Mediterranean to Aleppo has been revived. The American consul at Alexandretta, the Mediterranean terminus of the proposed line, and the only natural harbor on the Syrian coast, estimates that caravans numbering half a million animals annually come to this port from Bagdad and the country beyond the Euphrates. There are shipped to the United States alone 60,000 camel-loads of licorice root yearly. The port is served by twenty-four regular steamers a month, besides "numerous 'tramps' and sailing ships."

The Crop of American Peppermint.*

In spite of local decreases in acreage, the American peppermint oil industry seems on the whole to be still on the gain. Two areas practically include the entire American product, Western New York and Michigan. According to Schimmel's Bericht for October, the acreage and yield for the current year will show a decided increase over 1896.

In New York, the present status is as follows:

Old plants, 560 acres at 16 lb. of oil per acre	8,960 lb.
New " 740 " 30 " " "	22,200 "
Old oil on hand	6,040 "
Total:	37,200 "

In Michigan, local frosts have interfered with the industry somewhat, especially in the Muskegon districts. The year's total crop is expected, however, to show a decided increase over last year. The crop is distributed as follows:

East Michigan	13,000 lbs.
West Michigan	79,000 "
North Michigan	25,000 "
South Michigan	55,000 "
Indiana	32,000 "
Various localities	10,000 "
Total	214,000 "

The Indiana area is here included since it lies directly contiguous to the South Michigan area.

When this year's product of both regions is estimated the total obtained is 251,000 pounds against 196,000 pounds in 1896. It is regarded as probable that there are at present in the hands of the producers in America 270,000 pounds of oil. This together with the supplies of old oil lying in New York for higher prices makes it probable that no great increase in prices is likely to take place now.

It is an interesting fact that about one-third of the total peppermint oil output in America goes to Germany.

Crude Domestic Drugs.

In a recent article on this subject, Dr. D. M. R. Culbreth† has given some facts of general interest concerning the regions supplying our native drugs and the extent and nature of impurities frequently met with.

Cimcifuga is collected chiefly in Maryland, North Carolina, South Carolina and Virginia. Caulophyllum and podophyllum are usually present to the extent of about one percent each. Comfrey in small quantities occasionally also occurs in this drug.

Hydrastis comes mainly from North Carolina, South Carolina, Georgia and westward. That coming from the south generally contains a small percentage of *Aristolochia serpentaria* and that from westward a larger amount of *Aristolochia reticulata*. When in No. 20 to 30 powder, xanthorrhiza is added sometimes to cheapen and preserve the color.

Podophyllum comes from North Carolina, South Carolina, Georgia and the west. The chief admixture is blood root, sometimes to the extent of two to three percent. Sometimes a like quantity of geranium is present, also a small amount of comfrey. Fall collections prove to be the best grade of drug.

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* Schimmel's Bericht, Oct. 1897, p. 43.

† Bull. of Pharm. 1897, p. 409; from Druggists Circular.

Sanguinaria is collected mainly in Virginia, North Carolina, South Carolina and Tennessee. The chief adulteration is geranium (one to two percent). Small amounts of podophyllum and comfrey are also frequent.

Geranium is collected in Virginia, North Carolina and South Carolina chiefly. It is usually very pure since the most likely admixture, blood root, is higher in price. Frequently this drug is present in quantities as high as two percent. Geranium stems and leaves, a little podophyllum and comfrey are also not unusual.

Senega is derived mainly from Maryland and the South, Minnesota, St. Louis and Texas. Small quantities of blood root, podophyllum and poke root are apt to be present. Sometimes the false varieties (*Polygala alba* and *P. boykinii*) are mixed with it.

Prunus serotina bark is collected in Virginia, North Carolina, South Carolina and Maryland chiefly. The bark of the choke cherry (*P. Virginiana*) is sometimes present. The bark should be of fall collection, the amount of hydrocyanic acid present at that time being much greater than in the spring. The most serious annoyance with this drug springs from the collection at the wrong time of the year.

Viburnum prunifolium bark is collected mainly in the Carolinas, Georgia and Mississippi. Sassafras bark, from root and stem and stem bark of the black haw itself, form the chief admixtures.

Veratrum viride comes from South Carolina, Georgia and New York. A considerable amount of the beth root (*Trillium erectum*), also small amounts of podophyllum, poke root and cimcifuga are found in this drug.

Phytolacca is collected in Virginia, North and South Carolina, Georgia and westward. This is often very pure, but sometimes small quantities of burdock, podophyllum, yellow dock and dirt are found.

Asarum comes from Maryland, the Carolinas and the south. The packages examined by the author contained two percent of *Veratrum viride* and small amounts of podophyllum, blood root, black cohosh, blue cohosh and comfrey.

Angelica is a product in the main of the Carolinas and the south. The packages examined contained twenty-five percent of burdock root.

Sassafras bark comes from Maryland, Virginia, West Virginia and the Carolinas. Stem bark is a frequent admixture.

Reports and other pamphlets received:—

E. Merk—Darmstadt. Verzeichniss sämmtlicher Präparate, Drogen und Mineralien mit Erläuterungen. 1897. pp. 305.

McKesson & Robbins—New York. Blennostasine in catarrhal hypersecretion. Pamphlet, pp. 16.

Schimmel & Co.—Leipzig. Bericht. October 1897. pp. 96.

Price lists received:—

G. & R. Fritz.—Vienna. Price-Liste. Sept. 1897.

Fritsche Bros.—New York. Wholesale price-list. Oct. 1897.

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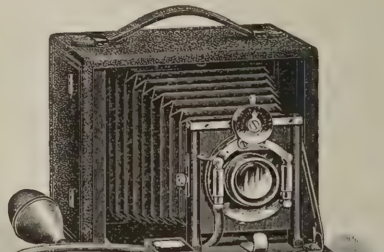

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SUPPLEMENT, DECEMBER 1897.

Scientific Organizations.

Pharmaceutical Legislation for Greater New York.

A joint committee representing the Kings County Pharmaceutical Society, the German Apothecaries Society and the New York College of Pharmacy met in New York November 11 to consider the duties of the new Board of Pharmacy to be created by the charter of Greater New York, and to discuss other matters pertaining to pharmaceutical legislation. The most important business was the consideration of a part of a proposed amendment to the law regarding registration. This provides that a registered pharmacist must have had four years' practical experience where physicians' prescriptions were compounded, and must have passed an examination before a board created by the act, or before some other board of pharmacy requiring equivalent examinations, whose examination the Board of Pharmacy should decide to be satisfactory. Assistants must have two years of experience and are to be prohibited from doing business except under the immediate direction of a registered pharmacist. Time spent in college is counted as equivalent to practical experience, for both assistants and registered pharmacists. Provisions are made for apprentices, who are not to be allowed to prepare prescriptions. All pharmacists must register within ninety days after the passage of the act and re-register at intervals of three years. The requirements of the act were endorsed by the members of the committee, but it was feared that some of them were in conflict with the provisions of the penal code. A subcommittee was appointed to secure a legal opinion on this question and to report at a subsequent meeting of the full committee.

Proceedings received:—

Proceedings of the Missouri Pharmaceutical Association 1897. Brochure, pp. 121.

Proceedings of the fifteenth annual meeting of the Michigan Pharmaceutical Association, 1897. Brochure, pp. 74.

Catalogues received:—

California College of Pharmacy—San Francisco. Prospectus of the twenty-sixth session. Session 1897—8.

In Memoriam.

Ludwig Andreas Buchner.

Death has taken another whose name is well-known not only in Germany, his native land, but wherever Science and Pharmacy are studied together. Professor Ludwig Andreas Buchner died Oct. 23 at Munich after a short illness, at the age of eighty-five years.

Buchner was born July 23, 1813, at Munich where his father, Dr. J. Andreas Buchner, likewise well-known in pharmacy, was then at the head of the Centralapotheke of the city public hospitals. He studied in the Gymnasium at Landshut and later in Munich, in 1829 beginning his apprenticeship in pharmacy with apothecary Bachmann in Nuernberg. From here, Buchner went to Strassburg and later to Paris, in which place he acted as assistant to Professor of Chemistry Bussy in the School of Pharmacy and attended lectures by the same teacher. In 1834, he returned to Munich in order to pursue further his pharmaceutical studies, and after two semesters he passed in a brilliant manner the governmental examinations. He now became assistant at the pharmaceutical institute in Munich and in 1839 received the degree of Doctor of Philosophy, submitting as his thesis "Betrachtungen über die isomeren Körper sowie über die Ursachen der Isomerie." A few years later he received the further degree of Doctor of Medicine, offering a dissertation on "Neue chemische Untersuchungen der Angelicawurzel." In 1842, Buchner became Privatdocent at the University of Munich. He then spent some time with Liebig at Giessen, later visiting the laboratories at Goettingen, Berlin, Leipzig and Vienna. In 1847, he was advanced to the Professorship of Pharmacy in the medical faculty of the University of Munich.

L. A. Buchner.

From this time on, Buchner's activities were followed by rich results, both as a teacher and as an investigator in pharmaceutical and pathological chemistry. He edited twenty-five volumes of the Neues Repertorium der Pharmacie (1852—1876), a commentary on the Pharmacopœa Germanica, to whose corps of workers he himself belonged, and a translation of Dumas' Handbuch der angewandten Chemie. Of his other numerous scientific works but a few titles can here receive mention. "Investigation of Berberine and of Aconitic Acid," "Preparation and Analysis of Tartrate of Antimony and Ammonia," "The Discovery of Angelic Acid, of Angelicin and of Rhamnoxanthin," "Observations on the Phenomena of Fermentation and Decomposition," and "Concerning the Formation of Salicylic Acid in *Spirea Ulmaria*" may be selected from the list. As an analyst also Buchner made for himself a name. In the spring of 1892 Buchner withdrew from activity as a teacher.

Friedrich Stohmann.

Karl Adolf Friedrich Stohmann, Professor of Agricultural Chemistry at the University of Leipzig, died on the 1st of November, aged sixty-five years. Stohmann, while especially well-known in agricultural chemistry, has contributed in many other directions to both pure and applied science.

He was born in 1832 at Bremen. He studied first in Goettingen under Woehler, later in London where Graham made him his assistant in the University College. After a short time at Munich, Stohmann began his career as a teacher, in Halle in 1865. In 1875, he was called to the University of Leipzig as professor, where he next served as director of the Agricultural-Physiological Institute. In 1887, the direction of the laboratory of agricultural chemistry was added. Stohmann is especially well-known for the preparation of hand-books of agricultural and technological subjects.

History.

Monument to Pelletier and Caventou.

A movement is on foot to erect a monument in Paris to Pelletier and Caventou, the discoverers of quinine.

Joseph Pelletier was born in Paris March 22, 1778, and died July 19, 1842. He was the son of an apothecary and adopted his father's profession. He was a member of the French Institute, a director of the École de Pharmacie and a member of the Academy of Medicine.

Joseph Bienaime Caventou was born in 1796 and died May 5, 1877. He became an apothecary and later professor of toxicology in the École de Pharmacie. He was also a member of the Academy of Medicine.

These two co-workers discovered strychnine in 1818, and quinine in 1820.

The Scientific Association of Upsala, Sweden, has affixed a memorial tablet to Scheele at the facade of the Lion Pharmacy in that town. The tablet bears the following inscription: "In this house lived Karl William Scheele, from 1770 to 1775. Here he discovered oxygen and other elements."

The following interesting clipping is taken from the Botanical Gazette:

Ancient Egyptian bread taken from the tomb of Mentuhotep and now in the Royal Museum at Berlin is found by L. Wittmack to still give the iodine test for starch. Microscopical study shows it to be made from barley and to contain the remains of yeast and bacteria. This indicates that barley is probable older as a cultivated grain than wheat, and that yeast, or dough of the previous baking, was doubtless used in those ancient times. The bread is estimated to be fully 4400 years old.

Bibliography.

It is announced that the ten years' supplement to the Index Kewensis, which brings the work down to the end of the year 1895, will be issued during the present year.

No. 15 of the Berichte d. d. chem. Gesellschaft contains an interesting biographical sketch of the late Professor of Chemistry at Heidelberg University, Victor Meyer, by his lifelong friend Prof. C. Liebermann.

"An Account of the Herbarium of the University of Oxford" has been compiled by the curator of the Fielding Herbarium, Mr. G. C. Druce. It is published at the Clarendon Press and gives particulars concerning the various special collections, the general collection, the British Herbarium and the Cryptogamic Herbarium.

The Year-book of Pharmacy for 1897 has appeared. It contains eighty pages more than last year. A portrait of Dr. Symes, President of the British Pharmaceutical Conference, faces the title page. The usual abstracts of work done in chemistry, materia medica and pharmacy during the year as well as various useful notes and formulæ are to be found.

Lea Brothers & Co. announce a number of new editions of medical works published by them: The twelfth American edition of Dr. A. S. Taylor's Manual of Medical Jurisprudence, revised and enlarged by Thomas Stevenson and edited by Clark Bell; Dr. Charles E. Simon's Manual of Clinical Diagnosis by means of microscopic and chemical methods, second edition, revised and enlarged; Dr. Hobart A. Hare's Practical Diagnosis: the Use of Symptoms in the Diagnosis of Disease, second edition, revised and enlarged; Dr. Hobart A. Hare's Textbook of Practical Therapeutics, sixth edition, enlarged, thoroughly revised and largely rewritten.

With its September number, the American Naturalist comes into possession of new proprietors and under the charge of new editors. It makes no large promises, but seeks to define its *raison d'être*. The new editor, as already announced, is Dr. R. P. Bigelow, of Boston, while among the associate editors the Botanical Gazette names the following botanists: C. E. Bessey, D. H. Campbell, H. M. Richards, E. F. Smith and W. Trelease. There is certainly a field for such a journal, and the responsible names connected with it are pledges of a very high character.

The Fern Bulletin is a small quarterly periodical devoted exclusively to a study of the Ferns. The October number of the current year contains about twenty pages of matter exclusive of advertisements. Two very neat cuts illustrate the harts-tongue fern and the creeping selaginella.

It is edited by Willard N. Clute. Publishers, The Fern Bulletin Co., Binghampton, N. Y. Subscription price per year, 50 cents.

One of the numerous halftones that illustrate Prof. E. P. Evans' article on Semon's scientific researches in Australia in the November number of Appleton's Popular Science Monthly is one which illustrates not less than sixteen wooden knives used by the inhabitants of the Trobriand Islands in betel chewing. The frontispiece of Carl Vogt in the same number, which is the first of the fifty-second volume, reminds one of the interesting sketches this scientist gave of Liebig in his memoirs which have attracted general attention. (See Supplement for 1896, pp. 26 and 33.)

Mr. W. T. Porter, secretary of the editorial committee of the American Physiological Society, announces that to meet the needs of investigators in physiology, physiological chemistry, physiological pharmacology, and certain other branches of biology, a special journal will be published, the first number appearing in January, 1898. The American Journal of Physiology, as the new publication will be called, will contain in each volume about five hundred pages, divided into parts or numbers, to be issued whenever material is received. It is expected that not more than one volume a year will be printed. The Journal will be edited by H. P. Bowditch, M. D., Boston; R. H. Chittenden, Ph. D., New Haven; W. H. Howell, M. D., Baltimore; Frederic S. Lee, Ph. D., New York; Jacques Loeb, M. D., Chicago; W. P. Lombard, M. D., Ann Arbor; and W. T. Porter, M. D., Boston.

Like all of the publications of Schimmel & Co. the catalogue of their library is a piece of work well done. It is not only of interest to know what the literary working apparatus of a large factory is, but it is also instructive to note the various departments of human knowledge into which the financial and commercial as well as scientific directors of such an establishment must branch out in order to attain the greatest proficiency. In the scientific departments we not only find Ostwald's Lehrbuch der allgemeinen Chemie und Victor Meyer's Chemische Probleme der Gegenwart, but also Kopp's Geschichte der Chemie, thus showing that both the most modern and the historic phases of science find a place in a modern factory. Not only is that branch of technology well represented which deals especially with the cultivation of fragrant plants and the extraction of perfumes, but geography, travel, etc., find a place with works of a more commercial and statistical nature.

Owing to the increase in the volume of matter of interest to botanists appearing in connection with the Royal Botanic Garden of Berlin, the Director, Prof. Adolph Engler, has found it necessary to issue at irregular intervals, as the accumulation of material may indicate, the Notizblatt des königlichen botanischen Gartens und Museums zu Berlin. Number one appeared in January, 1895, and Number ten in September of the current year. As interest in the German colonial possessions has increased, an interchange of plants between the garden and the colonies has been established much after the manner now existing between the Kew Gardens of England and the British Colonies. Plants of all kinds are finding their way into the Berlin garden where they are cultivated and studied; on the other hand, the Garden sends to the Colonies plants regarded as likely to prove of value in these warmer climates. Thus the Garden and the Museum have much of interest to contribute relative to the native flora of these parts and much also concerning the effect of the change of environment on the plants introduced into the Colonies. The Notizblatt aims to bring together this information in a form available to those interested. To both the student of plants from the economic standpoint and to the systematist, this periodical must prove highly valuable.

Catalogues received:—

Lemcke & Buechner—New York. Monthly Bulletin of World-Literature. Supplement 4—9.

Schimmel & Co.—Leipzig. Katalog der Bibliothek von Schimmel & Co. Januar 1897. pp. 68.

Julius Springer—Berlin. Empfehlenswerthe Werke für Pharmaceuten.

Commercial.

According to the Botanical Gazette, the Seaboard Air Line Railroad, which extends from Portsmouth, Va., to Atlanta, Ga., has inaugurated a novel system of instruction of the communities along its territory. It began by encouraging tree planting and village improvement. During the present season it has been holding one day farmers' institutes, all illustrative material and appliances, and the force of instructors being transported from place to place in a train of cars especially fitted up for the work. Another feature is the establishment of experimental farms every ten miles along the whole line; twenty-eight are now organized. Among the crops being tested are hops, ginseng, kafir corn and pyrethrum; fruits and grasses will be taken up in due course of time. Both the community and the railroad, and even the country at large, should profit by such well devised philanthropy.

Pricelists received:—

J. & A. Bosch—Strassburg. Waagen und Gewichte.

G. & R. Fritz—Vienna. Special Circular.

Fritzsche Bros.—New York. Wholesale Pricelist, November, 1897.

Wm. Kraft—New York. Pricelist of microscopic stains and mounting materials, etc.

Roessler & Hasslacher Chem. Co.—New York. Price-list, October, 1897.

Reports received:—

Fritzsche Bros.—New York. Semi-annual report, October 1897. Pamphlet, pp. 88.

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